User's Manual

LG Programmable Logic Controller

KGL for Windows

[MASTER-K Series]

LG Industrial Systems Co., Ltd.

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Chapter.1 Introduction

Chapter. 1 Introduction

1. 1 Features of KGL for Windows

KGL for Windows is the Programming and Debugging Tool for LG Master-K Series.
KGL for Windows has abundant Features as below.

1) Program Compatible between LG Master-K Series.
A user can use the Program (*.PGM) created in LG Master-K Series for the Program created in other LG Master-K Series as well.
The Program, Parameter or Variable/Comment created in KGL-DOS or GSIKGL can be also used in KGL for Windows.

2) PLC System Configuration by Project Structure
KGL for Windows manages the User-Defined Program as one Project including Parameter and Variable/Comment.
Also a user can save a Program (*.PRG), Parameter (*.PMT), Variable (*.VAR) or Comment (*.CNT) respectively and the stored each File can be used for other Project files.

3) User Friendly Interface
Easy and useful interface for Creating, Editing and Monitoring.

4) Online Editing
A Real Time Editing is available in Online mode. The Program edited in the Online condition can be downloaded automatically without stopping PLC Hardware.

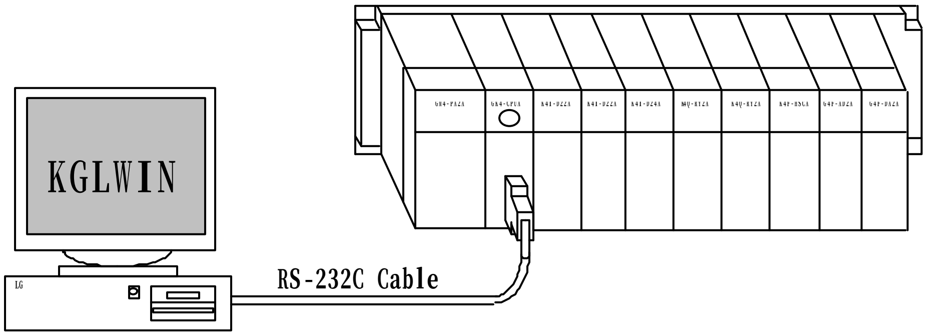
5) Monitoring the Information from PLC
A user can easily monitor PLC status such as Error Status, Network Information and System Status.

6) Debugging and Self-diagnosis (in New MASTER-K Series)
Trigger and Forced I/O Enable are available for the accurate Debugging.

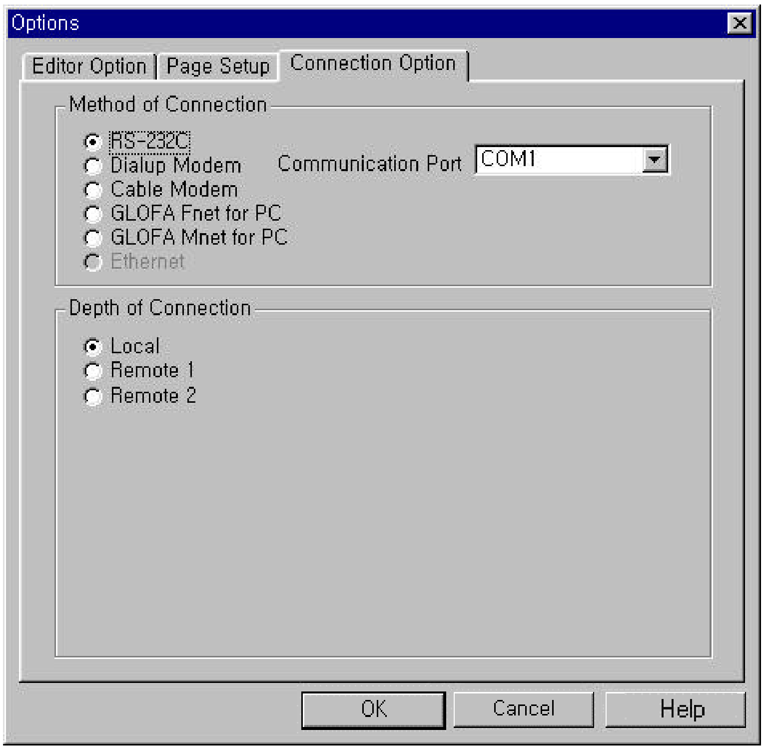
1. 2 Connection to PLC

1.2.1 RS-232C Interface for Local Connection

- RS-232C Interface for LG Master-K Series
- PLC can be connected with the serial port (COM1 ~ COM4) of Computer by RS-232C Cable.



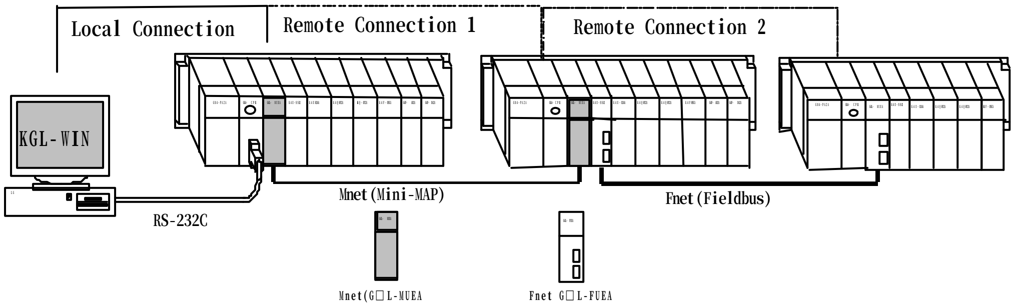
- Click 『**Options**』 Menu in 『**Project**』 Menu and Select 『**Connection option**』 tap**.** Then the following screen will be shown.



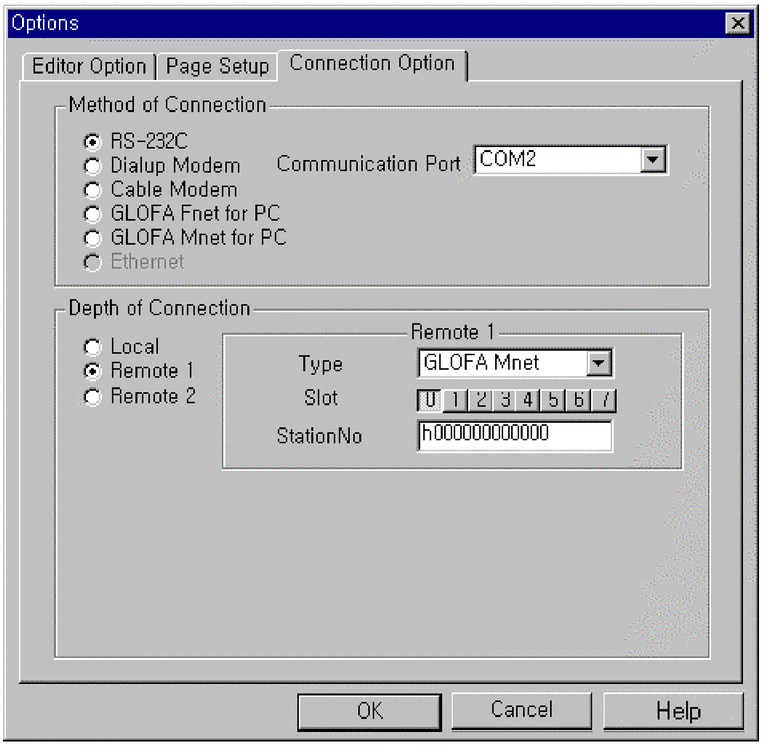
- Select『**RS-232C**』 and proper COM port in Connection Option.
- Select『**Local**』 as the 『**Depth of Connection**』 and click OK button.
- Select『**Connect+Download+Run+Monitor Start**』 in Online Menu.

1. 2. 2 RS-232C Interface for Remote Connection (available to K80S, K200S, K300S, K1000S only)

- Remote Connection means that PLC's are connected through the communication modules but not to the computer directly as Local Connection. Remote Connection also can do download, upload, mode change or monitoring like Local Connection.



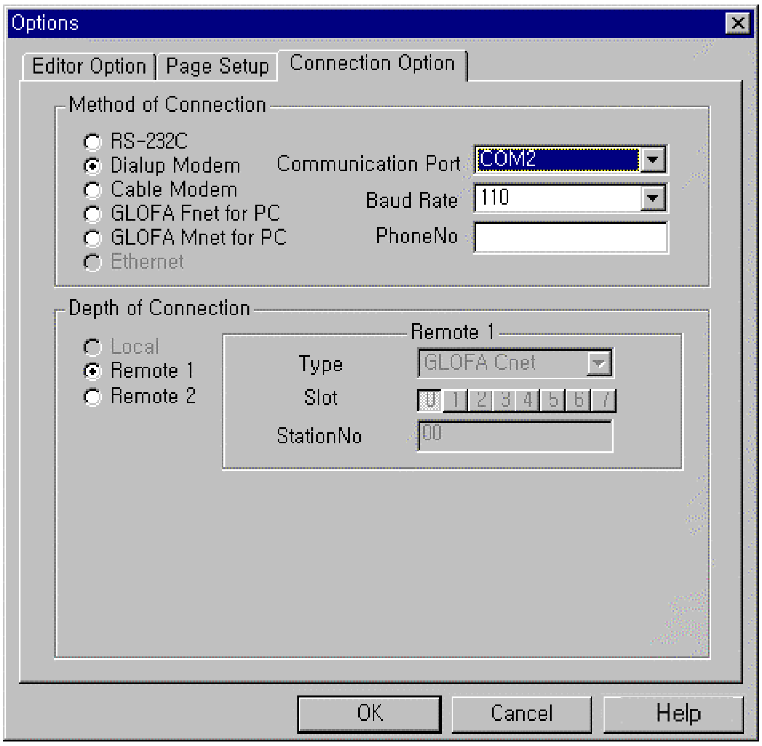
- Select Remote 1 or Remote 2, and then setup the Network Type, Slot Number and Station Number.



- Select『**Connect+Download+Run+Monitor Start**』 in Online Menu.
- For more information, please refer to user's manuals for MASTER-K Fnet(Fieldbus module), Mnet(Mini-MAP module).

1. 2. 3 Dial-up Modem(or Cable Modem) Connection (available with MASTER-K Series only)

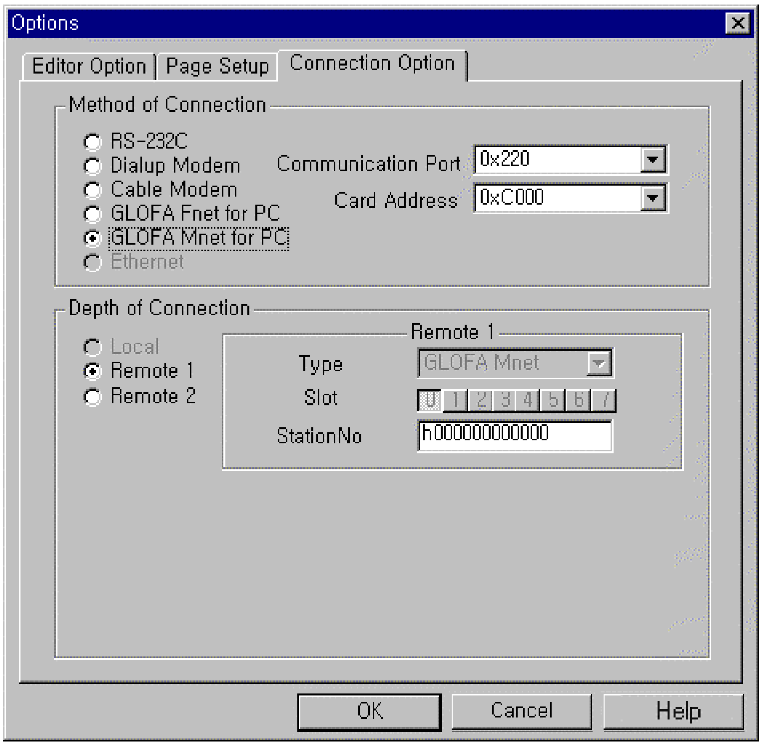
- The long distance connection using a modem is only available for Remote Connection Mode or for PLC with the computer module (G L-CUEA).
- After selecting **Project - Options - Connection Option - Dial-up Modem** or **Cable Modem**, setup the Communication Port, Baud Rate and Phone number (in Dial-up Modem select).



- Select 『**Connect+Download+Run+Monitor Start**』 in Online Menu.
- For more information, please refer to user's manual for New MASTER-K Cnet(Computer Link module).

1. 2. 4 Connection using Communication module

- This connection is only available for Remote Connection using Fieldbus or Mini-MAP. So, in order to use this Connection, a user should prepare the communication modules (Fnet, Mnet) to be mounted on PLC and the communication boards (GOL-FUEA, GOL-MUEA) to be mounted on the Computer.
- Setup Communication Port, Card address and Station number in 『Connection Option』 Menu.
- Select 『**Connect+Download+Run+Monitor Start**』 in Online Menu.
- For more information, please refer to user's manuals for New MASTER-K Fnet(Fieldbus module), Mnet(Mini-MAP module).



1. 2. 5 Connection using Network(Ethernet)

- ♦ This connection is only available for Remote Connection. To use this Connection, Network module(Ethernet module) should be installed in PLC.
- ♦ Select **Ethernet** in 『Connection Option』 Menu.
- ♦ Setup IP address and Slot number.
- ♦ Select 『**Connect+Download+Run+Monitor Start**』 in Online Menu.
- ♦ Ethernet module is under developing.

Chapter. 2 Installation

Chapter. 2 Installation

2.1 System Requirements

- Recommended System Requirements for KGL for Windows

1) IBM Computer compatible and Memory (RAM)
   80486DX or greater, 8Mb RAM or more

2) Serial Port
   One or two Serial Ports

3) Hard Disk
   20Mb or more

4) Floppy Disk Drive
   One or more(3.5 Inch or 5.25 Inch)

5) Mouse and Printer
   For Windows 95

6) Operating System
   Microsoft Windows™ 95 or more

2.2 Installing the Software

To install KGL for Windows from the compressed diskettes, be sure to use the original installation diskettes.

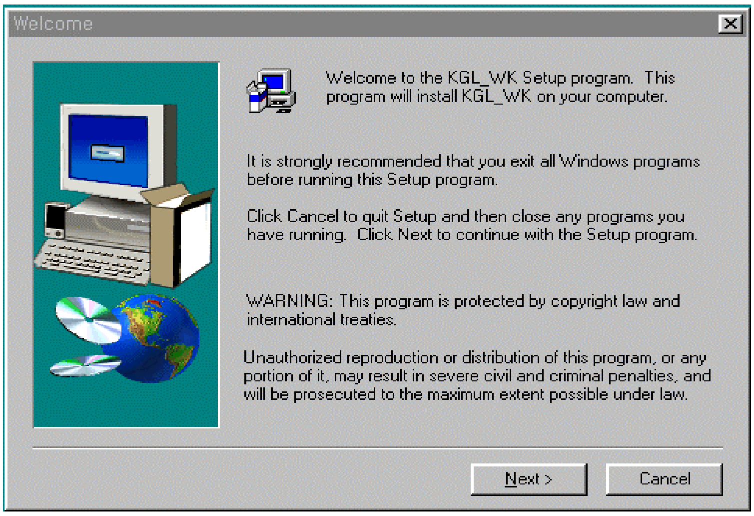
If you copy the files in the diskettes to a folder in your hard disk manually, the software won't be installed.

- Installation the setup program

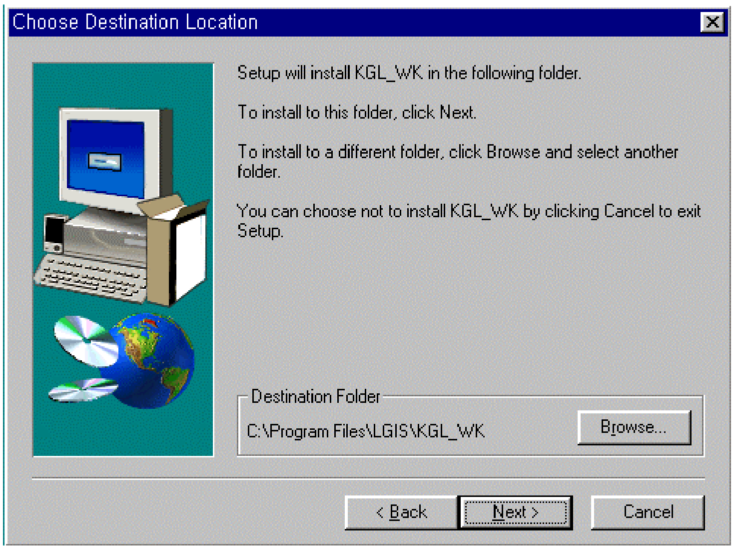
  → Double-click 'Setup.EXE' file in the installation Disk1.

- The Setup Wizard will guide you to install the Software automatically.

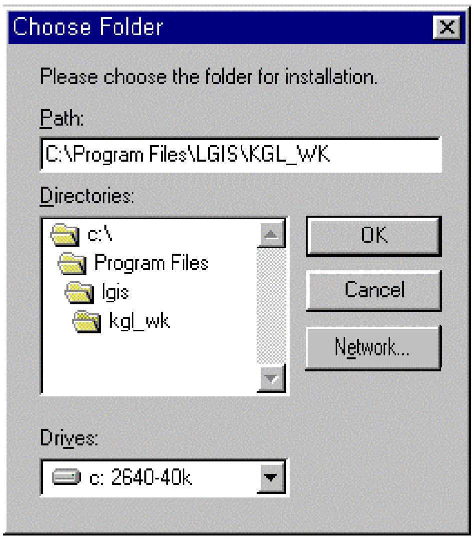
- Press Next button to start the installation. You can press Cancel button if you don't want to install KGL for Windows at this time.



- Select Destination Folder which KGL for Windows files are to be installed. You can change the folder using Browse button or click Cancel button to cancel the installation.

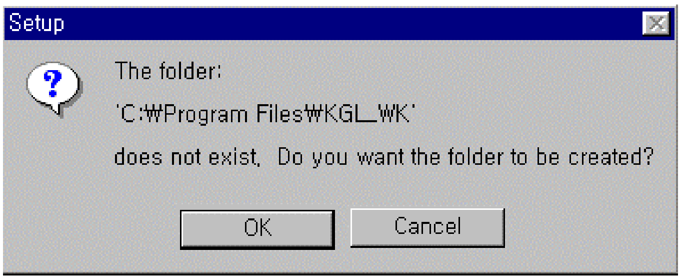


◆ If you press Browse button, you can choose the folder to install the Software as shown in the dialog box.

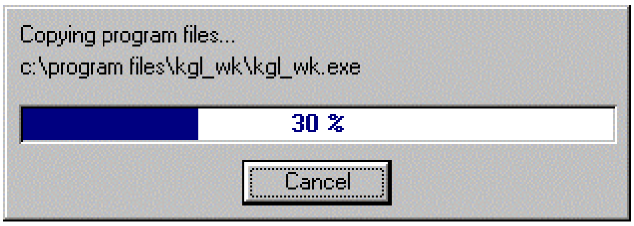


◆ After selecting the folder or typing the Path to install the program in the dialog box, click OK button.

. If the folder does not exist, the following dialog box will be shown. If you want to create a new folder, press OK button.



◆ The installation process will be displayed as below.



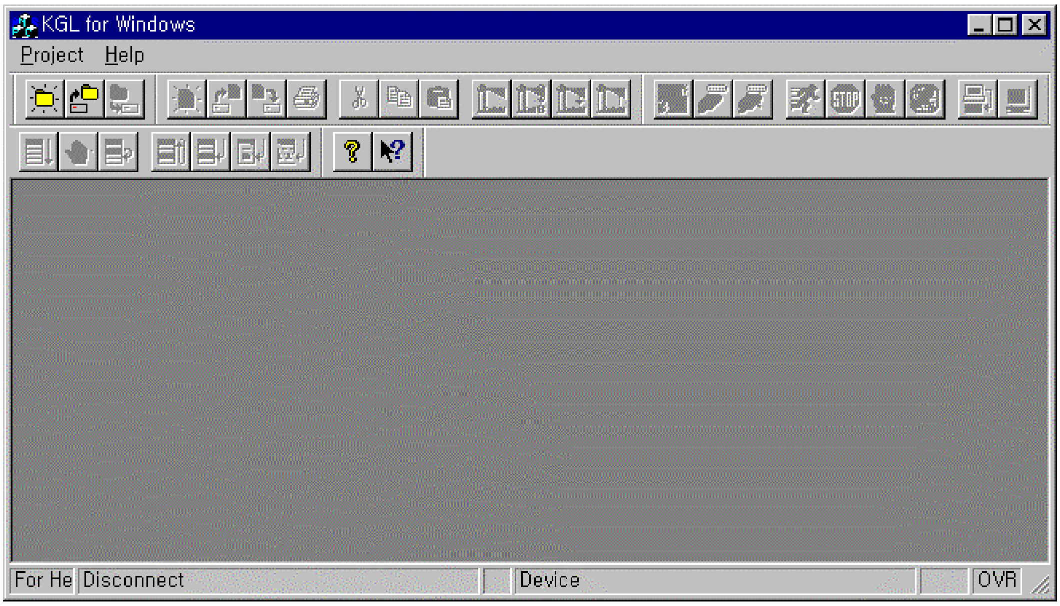
◆ After the installation, the folder is created. The execution file and Readme icon will be also created in the Start Menu of Windows95. To start KGL for Windows, double-click the execution icon(

Chapter. 3 Start-Up KGLWIN

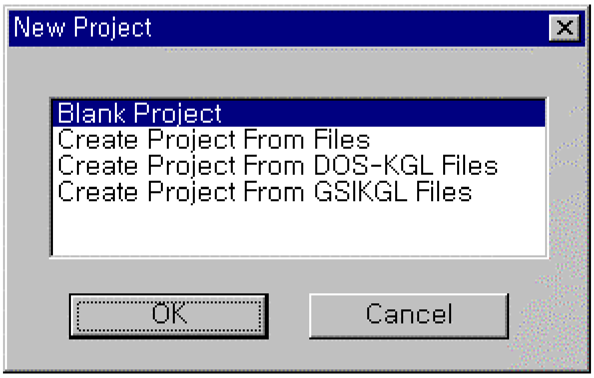
Chapter.3 Start-Up KGLWIN

3. 1 Creating a Project

- Double-click KGL_WE.exe file to run KGLWIN.
- The Start-up Screen will be shown as below.

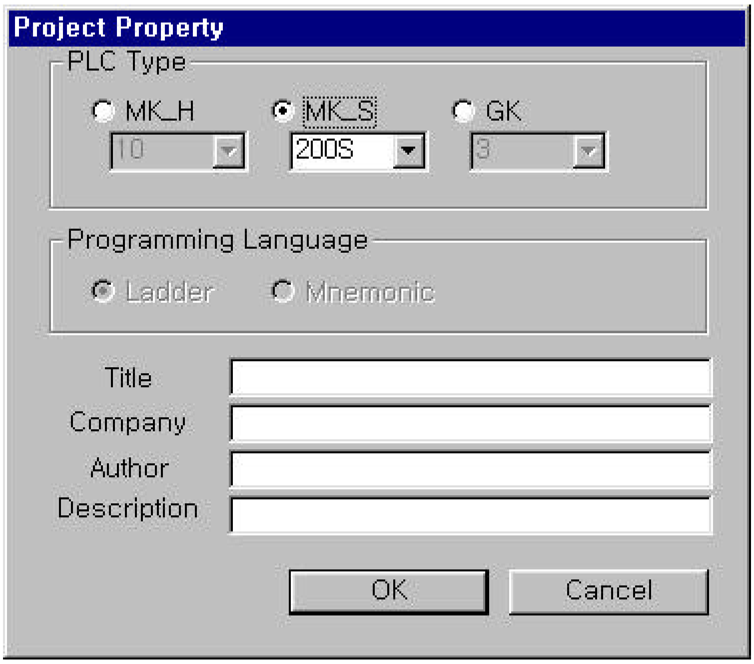


- To create a new project, select **Project- New Project**... ( the Start-up Screen.
- Select **Blank Project** in the dialog box and click OK button.

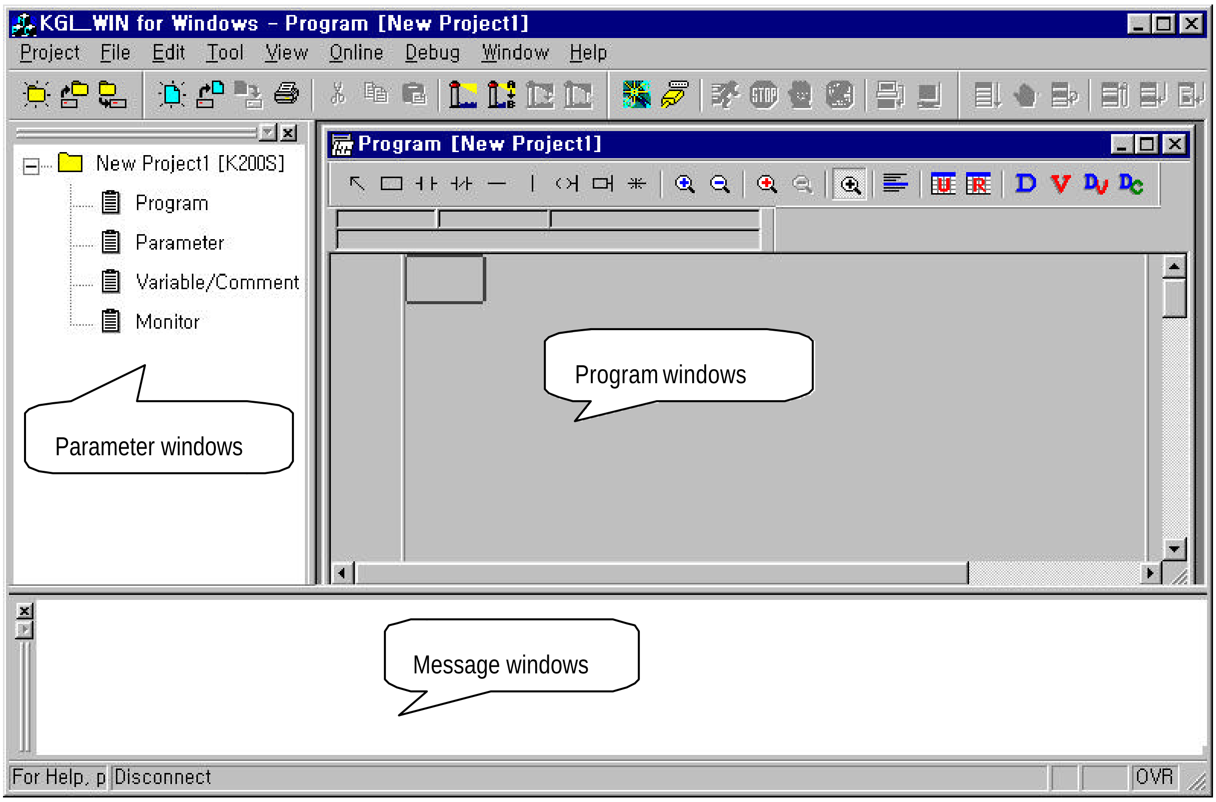


- In the following dialog box,

  Type in PLC Type, Programming Language, Title, Company, Author and Description.



◆ Click OK button. Then, Project, Message and Program Windows are displayed automatically.

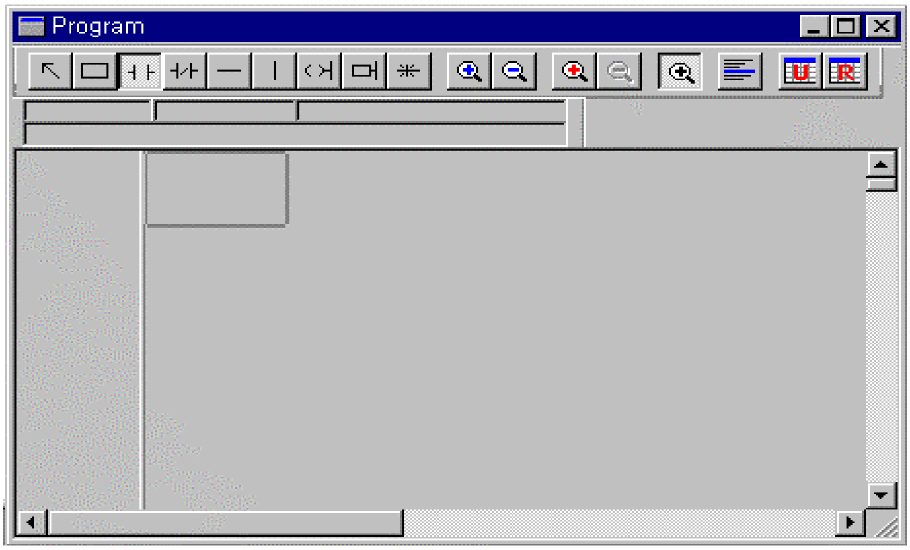


◆ You can also create a new Project using already created files from KGL-DOS or GSIKGL as well as KGLWIN. For more information, please refer to Chapter. 4.2 Creating a Project.

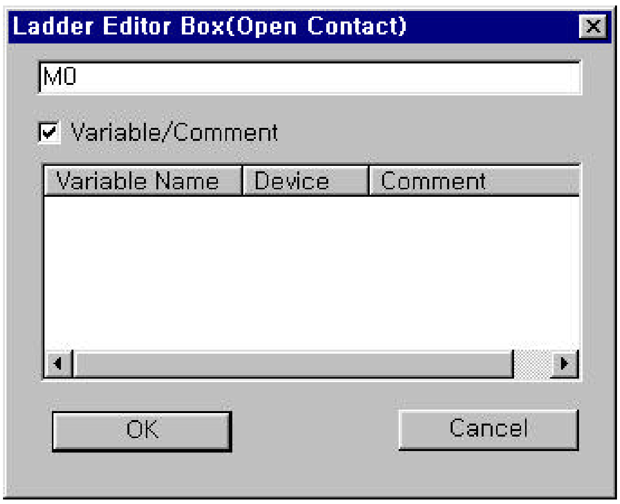
3. 2 Creating a Program

3. 2. 1 Creating a Ladder Program

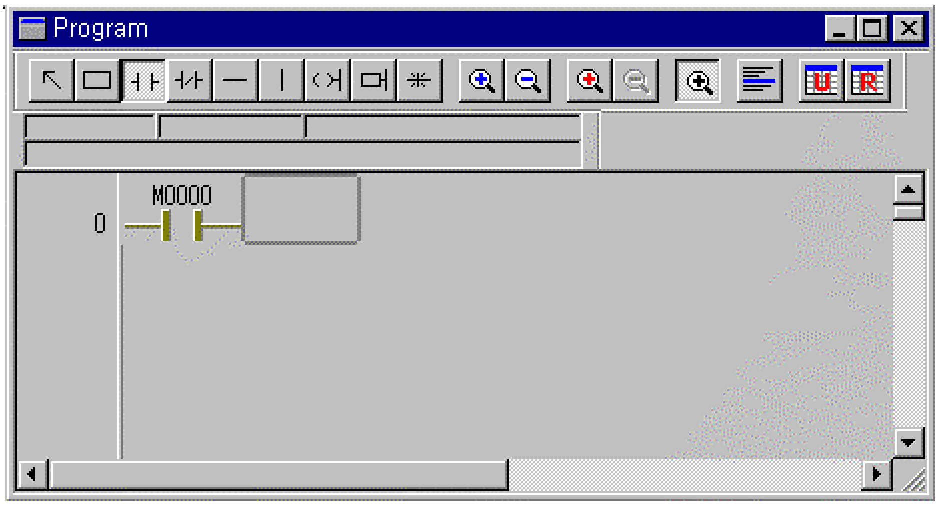
- This chapter describes creating a program in Ladder Window using the Tool Bar.



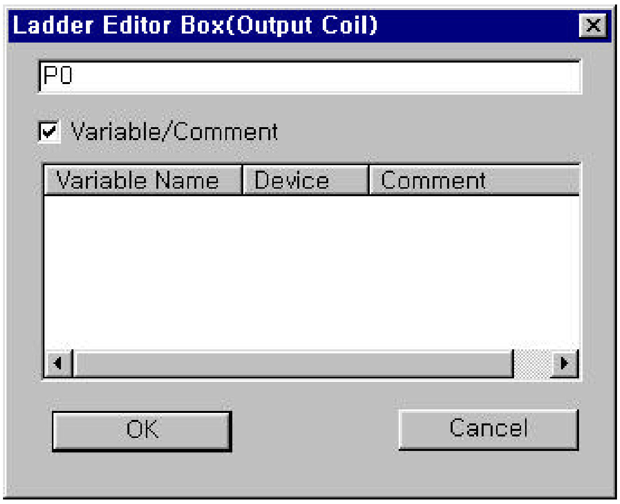
- After selecting the Normally Open Contact( ) in the Ladder Tool Bar, Move the cursor to the place to insert the contact.
- Click the left button of the mouse or press Enter key, then the contact input dialog box appears.



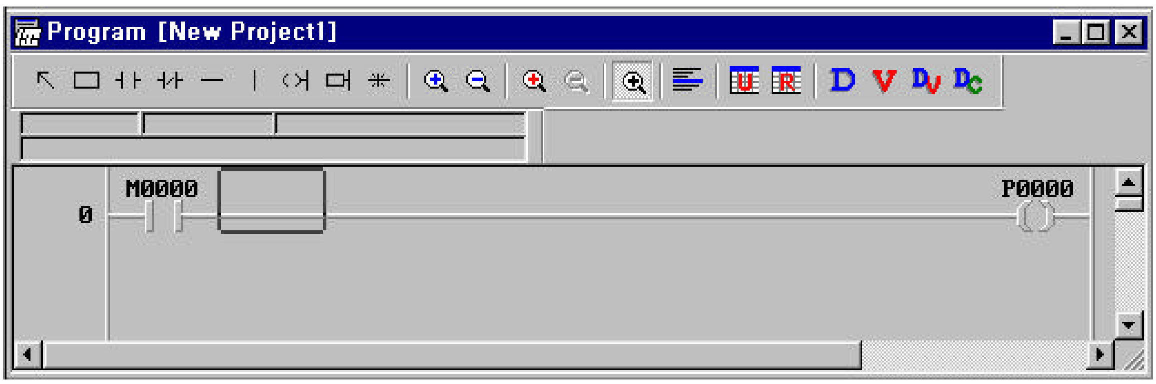
- Type in the contact name(M0000) you want to insert and click OK button or press Enter key.



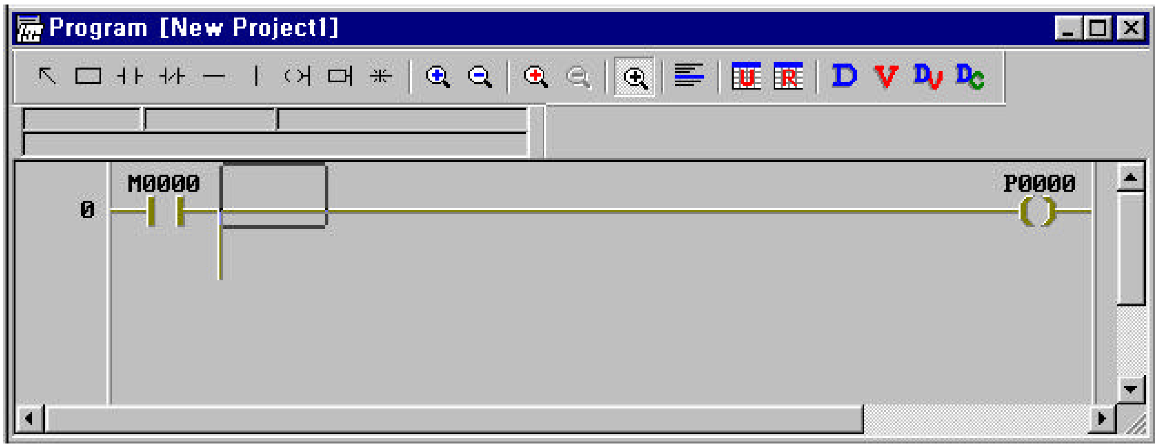
♦ Select the Output Coil (⟨ ⟩┤ on in the Ladder Tool Bar and move the cursor to the next column of M000. Click the mouse button or press Enter key.



♦ Type in the Output Coil (P000) and click OK button or press Enter key.

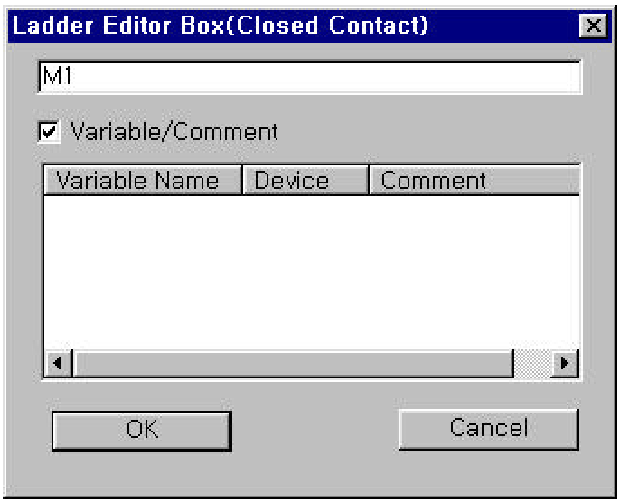


♦ Select the Vertical line (|)icon in the Ladder Tool Box and click the mouse button on the cursor position.



♦ To delete Vertical line, select Vertical line and press del key or press back space key in above picture.

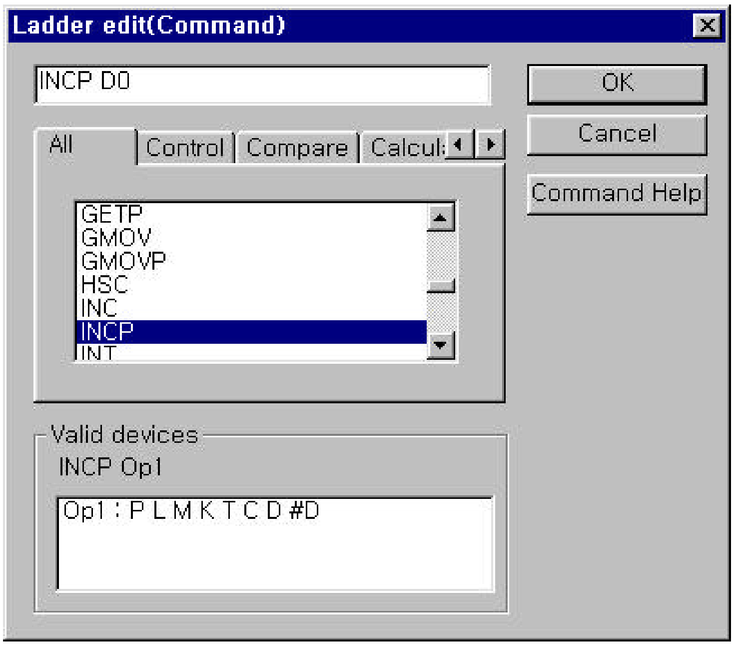
♦ Select the Normally Closed Contact ( )icon in the Ladder Tool Bar and Move the cursor to the place to insert the contact. Click the mouse or press Enter key to open the input dialog box for the contact input.



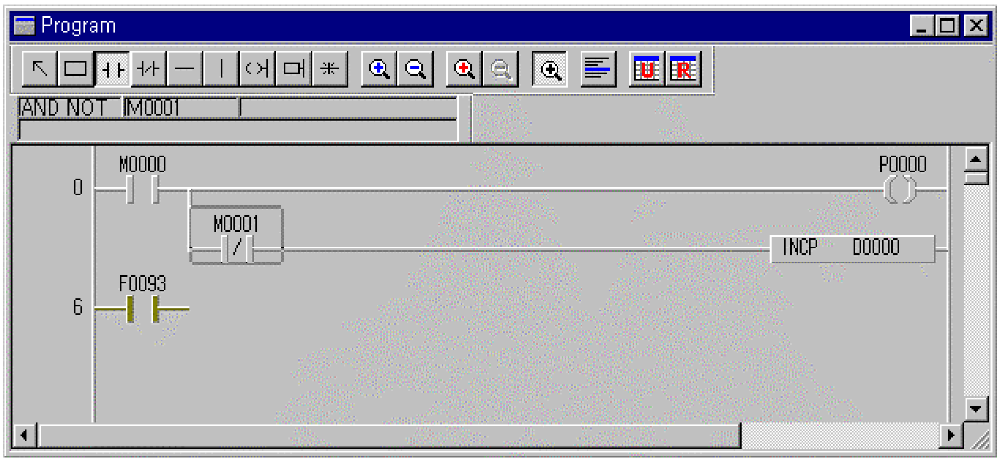
♦ Type in an input contact that you want and click OK button or press Enter key.

♦ After selecting the Applied Instruction icon( )in Ladder Tool Box, click the mouse or press Enter key.

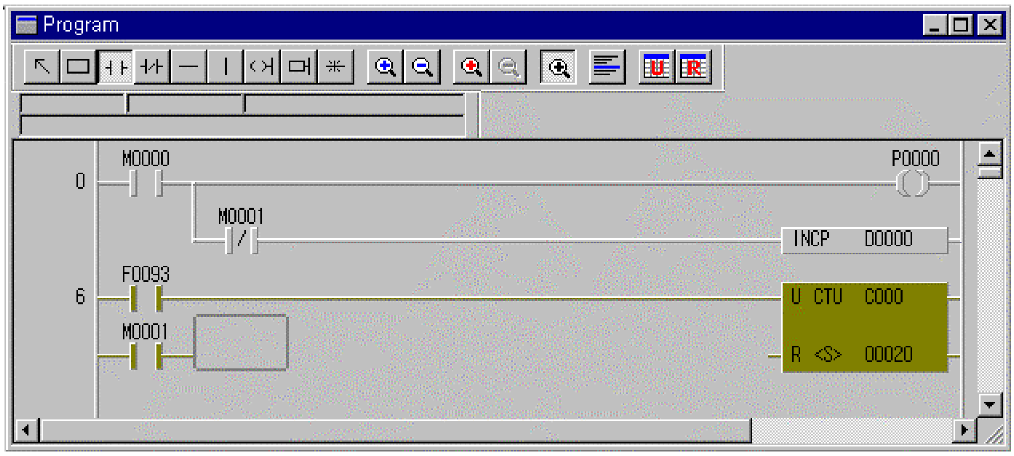
♦ Type 『INCP D0000』 in the Ladder Editor Box.



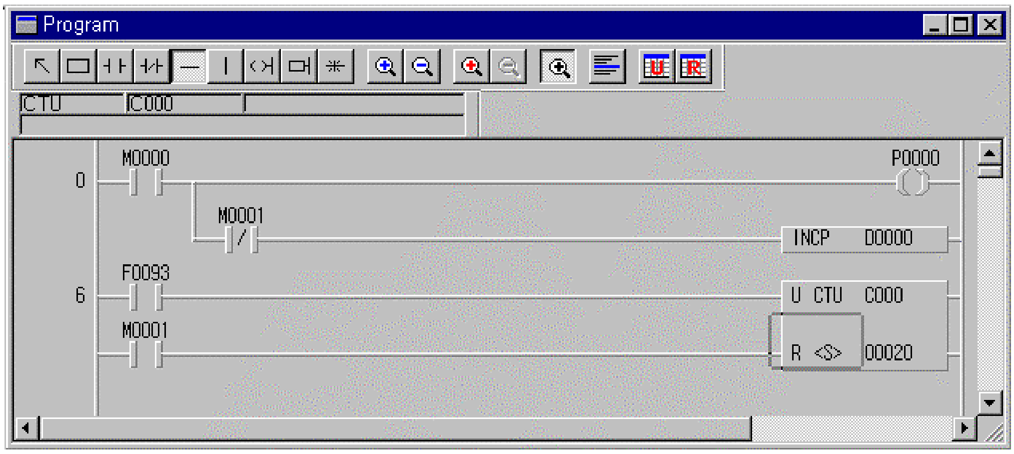
- Select the Normally Open Contact(┤├ icon in the Ladder Tool Bar and move the cursor to the next start line → Click the mouse or press Enter key.
  → Type F0093 (System pulse clock for 1 second)



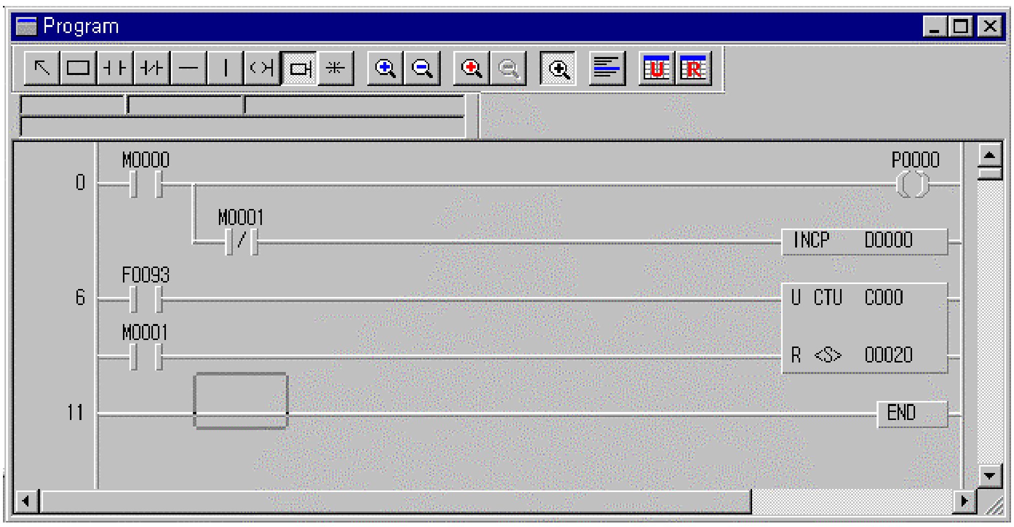
- Select the Applied Instruction icon(⊏┤ in the Ladder Tool Bar and type 『CTU C000 20』.
- For the Reset input of the Counter, type M0001 in the reset position after selecting the Normally Open Contact.



♦ To complete the Ladder line, select the Horizontal Line (—) in the Ladder Tool Box. And click the mouse to fill the spaces between two icons with the line.

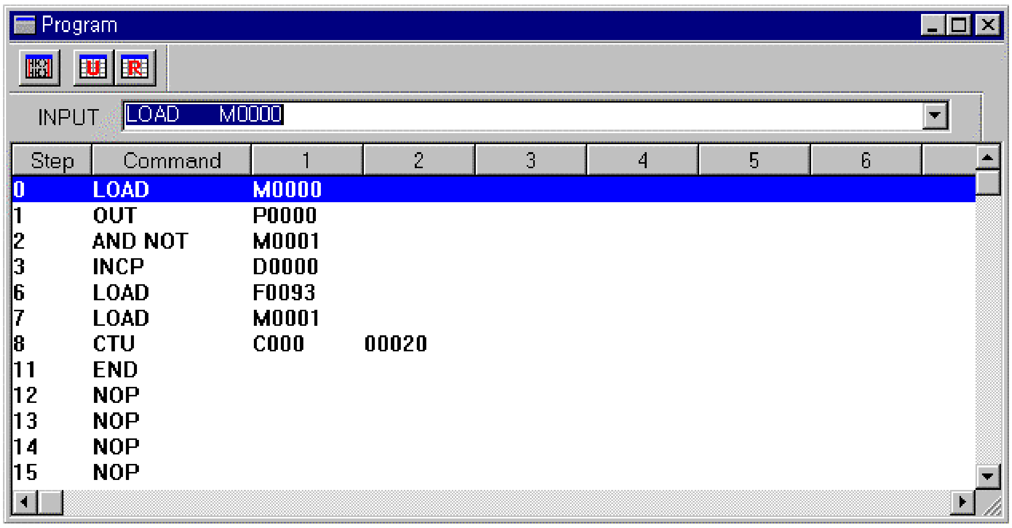


♦ To finish the program editing, insert『END』Instruction in the next line. Select the Applied Instruction icon ( ) to enter『END』instruction and press Enter key or click the mouse button.



3. 2. 2 Creating a Mnemonic Program

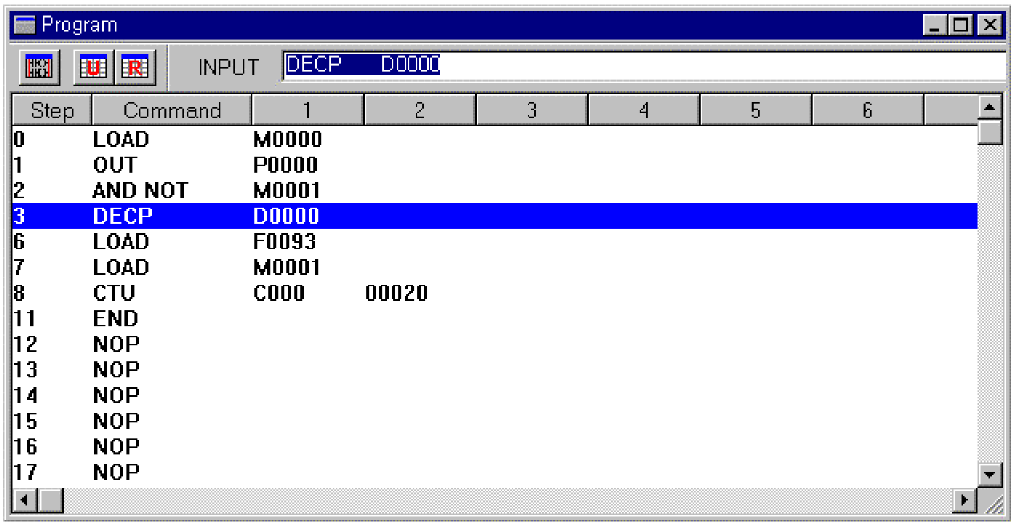
◆ In order to view the Mnemonic Program in the Ladder Program Mode, Click the Mnemonic icon( ) in the Ladder Tool Box.



◆ In order to edit a Mnemonic Program, move the selection bar to the Step you want to insert.

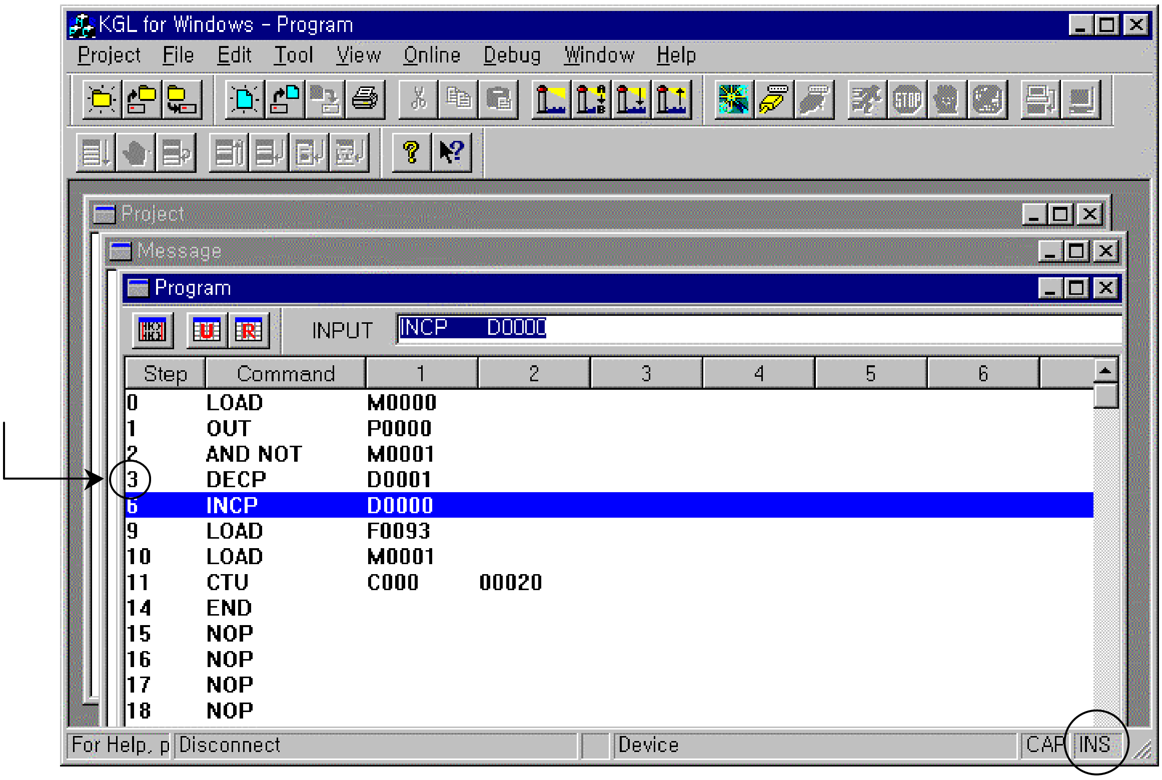


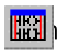
◆ To replace the Instruction 『INCP』 into 『DECP』, Type in 『DECP D0000』 on the Step No. 3 using the Input Bar.



- If you want to insert the Instruction 『DECP』 in front of the Instruction 『INCP』, press Insert key in the keyboard. → The edit mode will be changed from **OVR** to **INS**.

  → Type the Instruction on the Input Box and press Enter key.

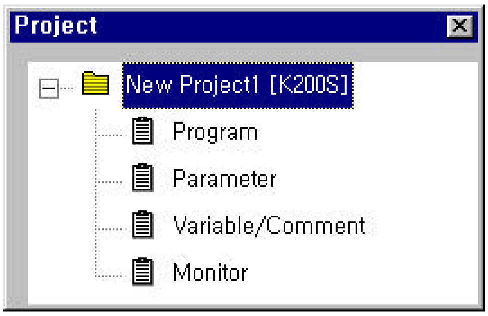


- To return to the Ladder Program Mode, press the Ladder icon( the Mnemonic Tool Bar.
- To insert a new line, press CTRL+M.
- To delete a existing line, press CTRL+U.

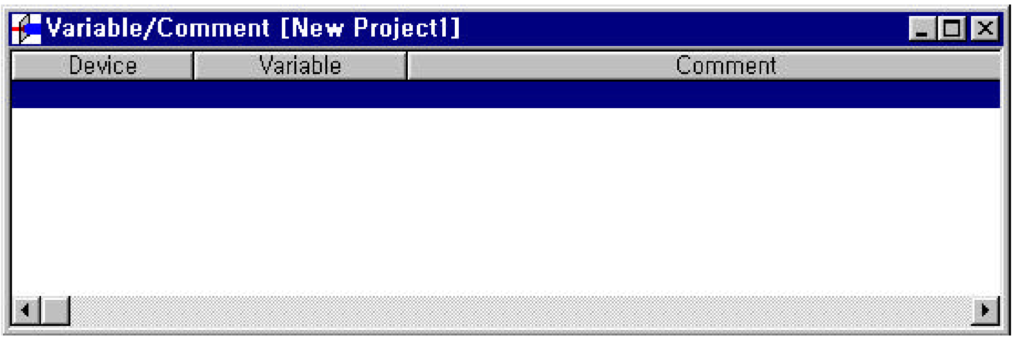
3. 3 Edit Variable/Comment

3. 3. 1 Input Variable/Comment

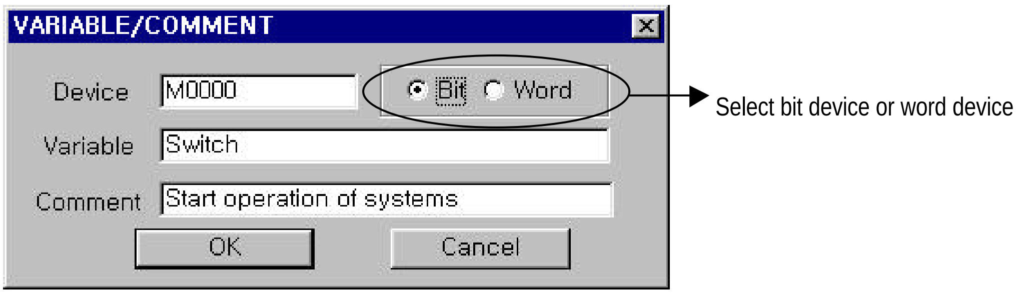
- In order to input Variable/Comment, select Variable/Comment in Project window.



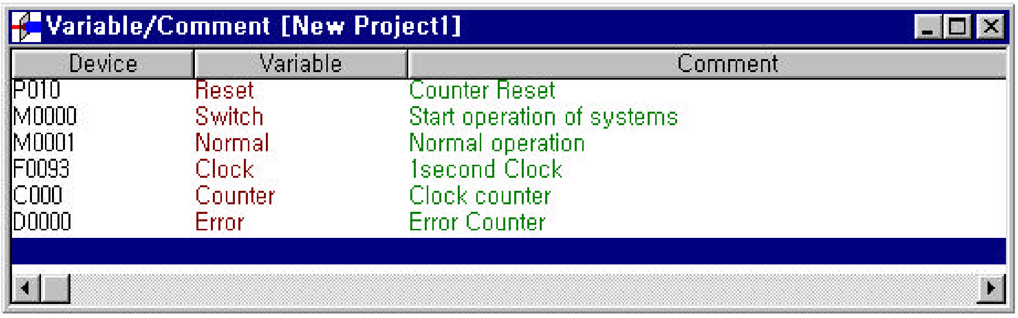
- If you double-click Variable/Comment, Variable/Comment window is appeared.



- If you press enter key or double-click, Variable/Comment edit box is appeared.

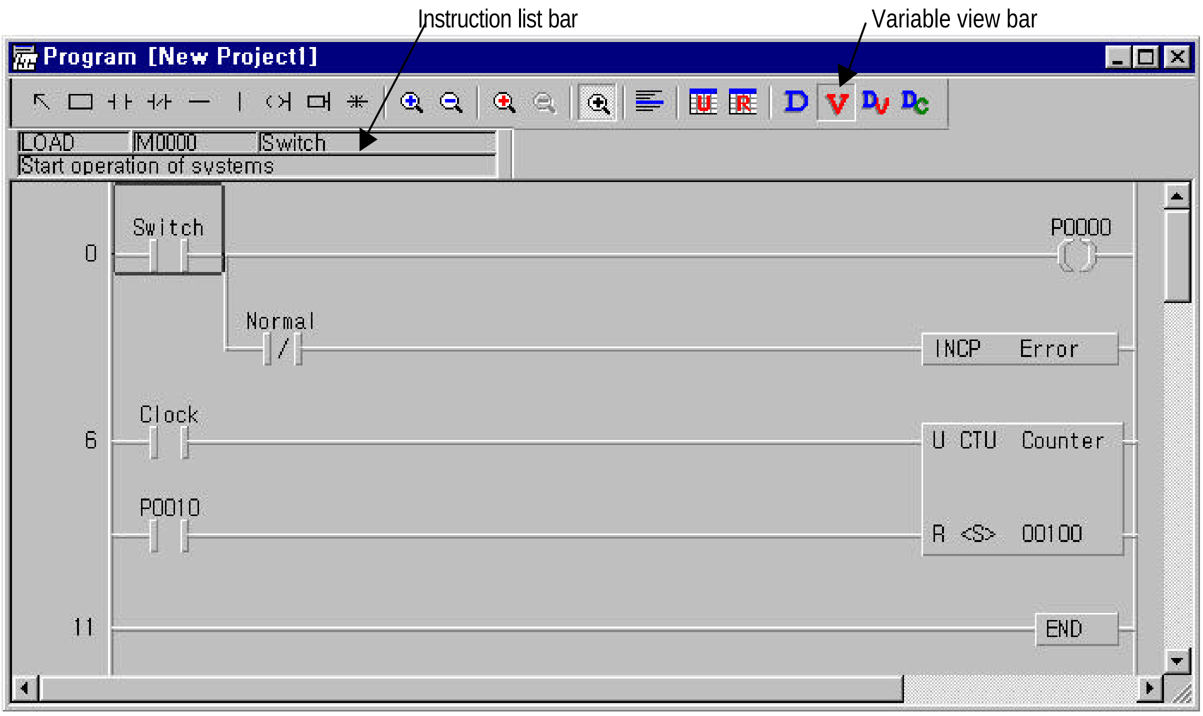


- In Variable/Comment edit window, input device name, variable, comment and click OK button.
- In the same way, edit Variable/Comment for used device.



3. 3. 2 Variable/Comment view

- If you click ( you can see variable name instead of device name.
- If you place cursor at a device, you can see variable/comment in Instruction list bar.



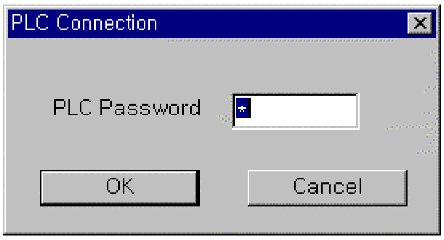
3. 4 Connect to PLC (Online)

3. 4. 1 Connection

- In order to communicate with PLC, connect the RS-232C port of CPU module with the computer serial port by RS-232C Cable.

→ Select **Online-Connect**( in the Pull-down menu.

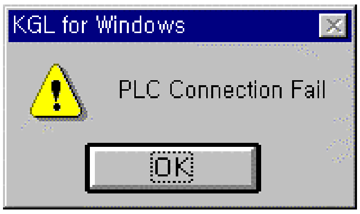
→ Type the Password

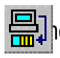


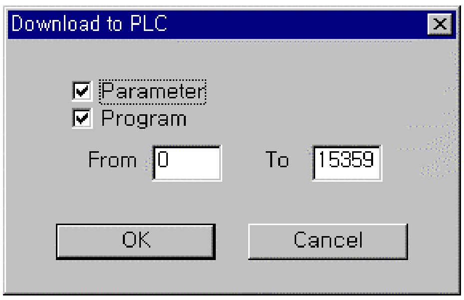
- If you don't have any password, the password window will not appear.
- See 6.4.2. of this manual for more detail about password.
- If the connection is completed, the message appears on the Status Bar as below..



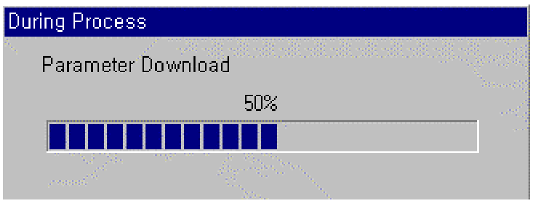
- If the connection is not completed normally, the Message Window will appear as below



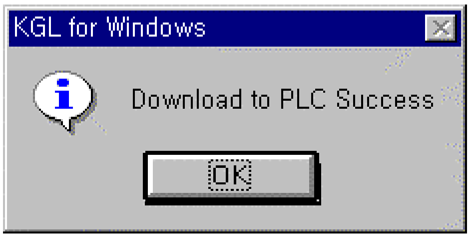
- If connection fails, confirm the RS-232C Cable and examine Connection Option in **Project- Options...** of the Pull-down menu so as to choose 『**Local**』 as the **Depth of Connection.**.
- If the connection is completed normally, select **Online-Download** ( menu. Then the following dialog box will be opened.



♦ Click OK button to continue the process. Then, the program and parameters are downloaded to PLC.



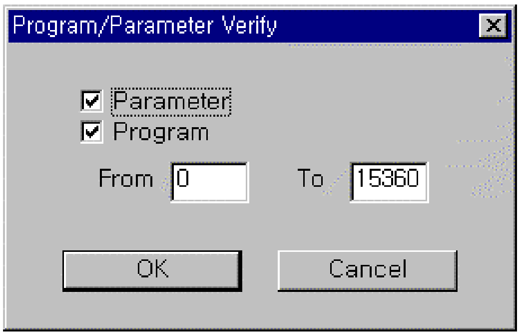
♦ **Download** is only available on **Stop** ( Mode. Confirm the status in the Change Mode.



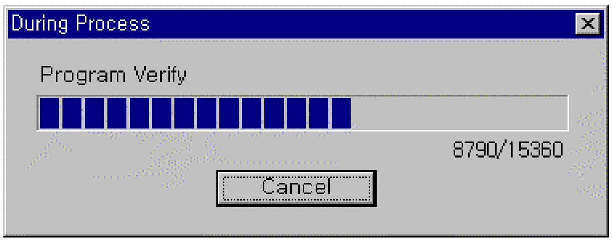
→ Click OK button.

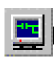
♦ Select **Run** ( Mode in **Online - Change Mode** menu.

♦ To examine the program and parameters stored in PLC are the same one of KGLWIN, select Online-Verify menu. Then, the following message box will appear. Click OK button to verify.



♦ Click OK button to start verifying. If you want to stop verifying, click Cancel button.



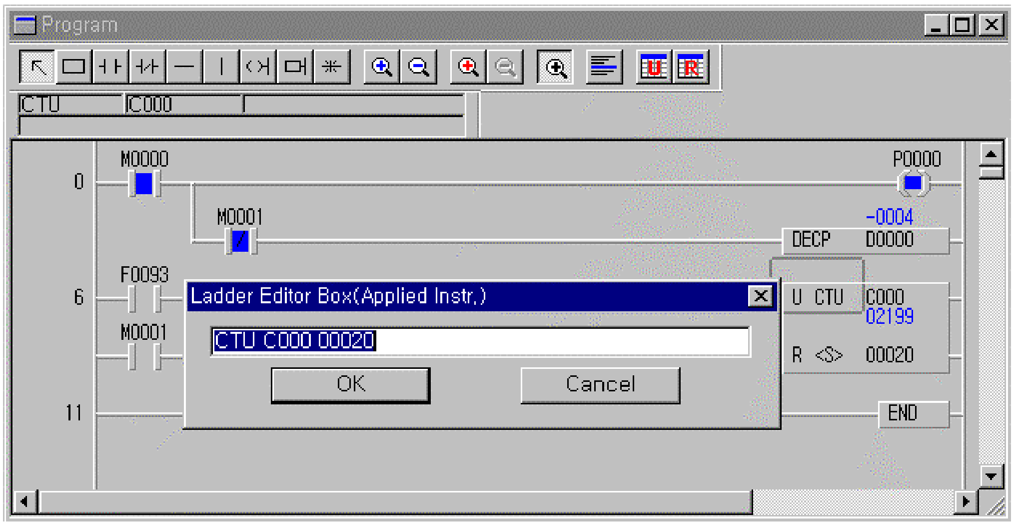
♦ To monitor the Used Device or PLC System, select **Monitoring**( Mode in **Online – Monitor Start** menu. Then, the following message box appears to verify the program and parameters with ones in PLC.

3. 4. 2 Connect+Download+Run+Monitor Start()

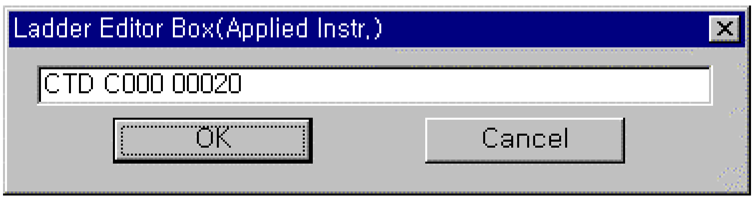
- Connect, Download, Run and Monitor Start Functions described in Chapter.3.3.1 are executed at one time by clicking the Connect+Download+Run+Monitor Start button in the Pull-down menu.

3. 4. 3 Online Edit

- This Function is performed only when the verification is completed and in the Monitoring mode. In this mode, you may not execute the Download Function after editing. It' ll be done automatically.
- The program is changed automatically without the mode changing into Stop mode. So, you must be careful when you do edit the program in the Online mode.
- In order to edit the program in Chapter. 3.2.1, move the cursor on the Instruction that you want to change and double click or press Enter key.

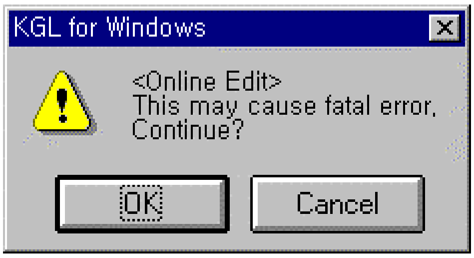


- Type the new Instruction or Device to change in the Editor Tool Box.



→ Click OK button.

- The Message Box to confirm the change will appear below.

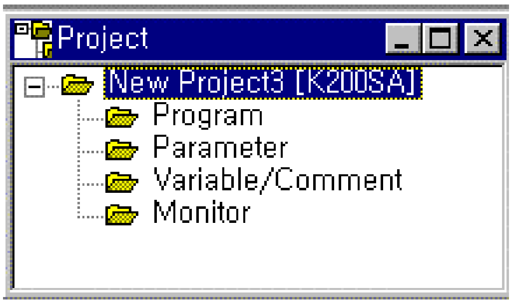


- Click OK button to complete the Online Edit.
- To complete Online edit, click OK button in Message box for confirm

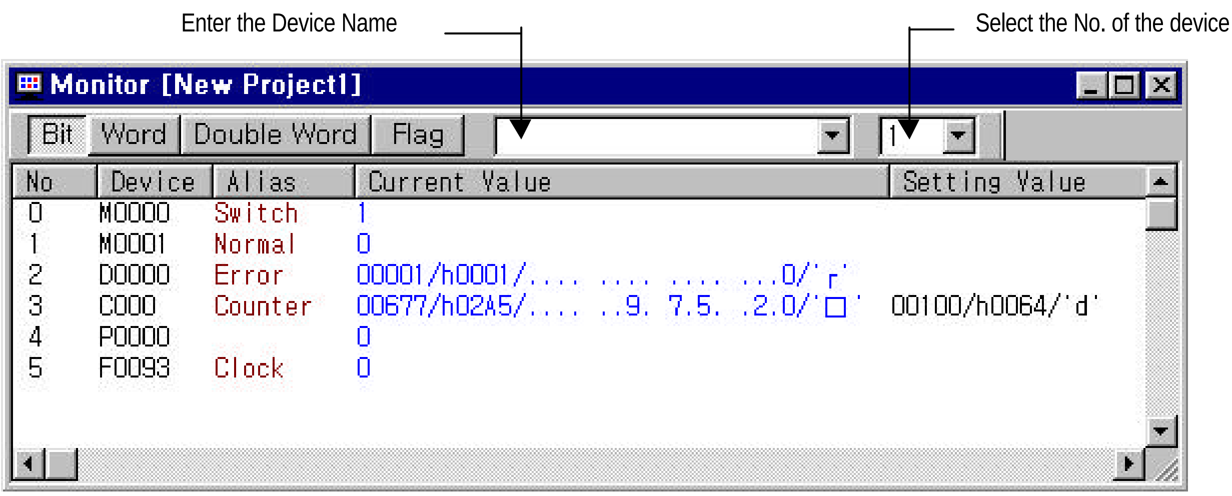


3. 4. 4 Monitoring

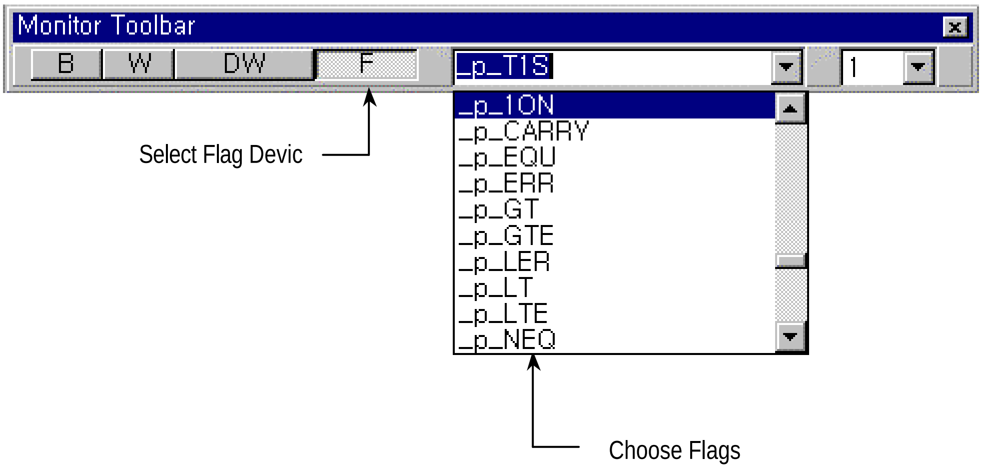
- To monitor the PLC Devices or System Information, select Monitor in the Project window.



- After selecting the type of Device to monitor, enter Device Name and Number.

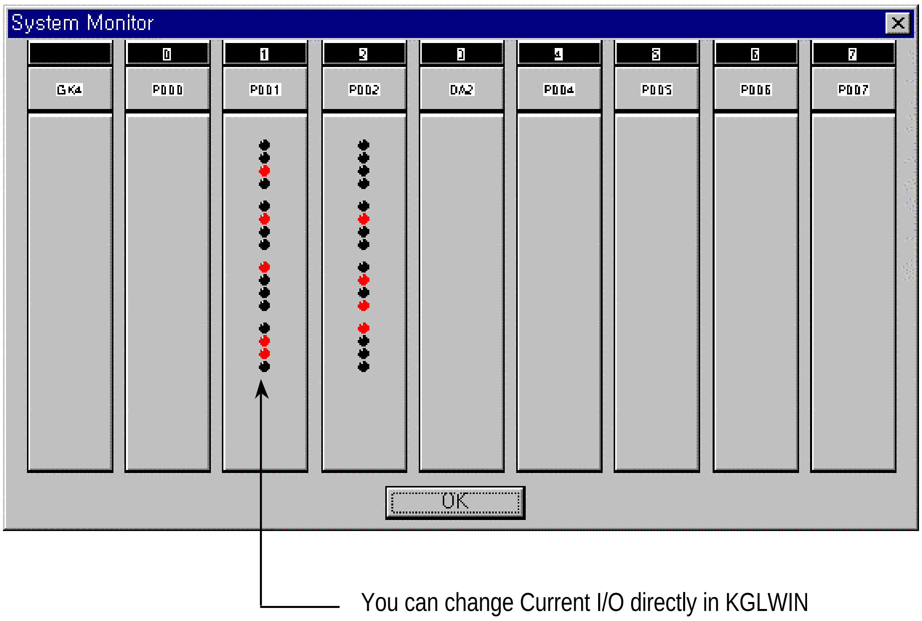


◆ If you want to monitor Flags, you can choose Flags in the following combo box after selecting F Device.



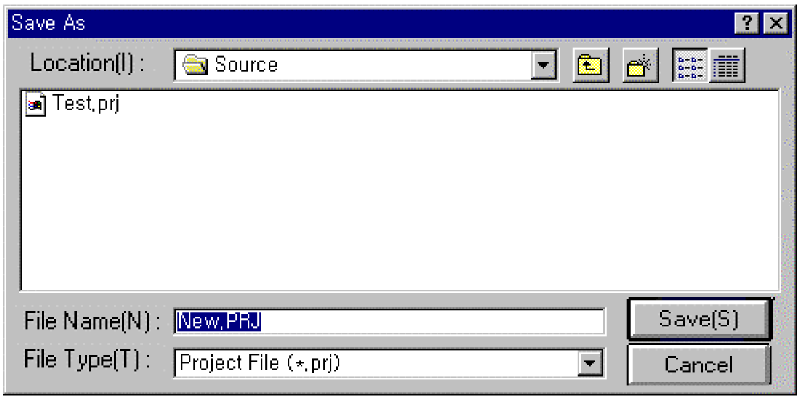
◆ You can monitor other detail information such as PLC information, I/O Information, Link Information and more.

For more information about the Read/Write, please refer to Chapter 6.2. Monitoring & Mode Change.



3. 4. 5 Save the Project

♦ To save the Project created in the above, select **Project - Save Project** in the Pull-down menu.



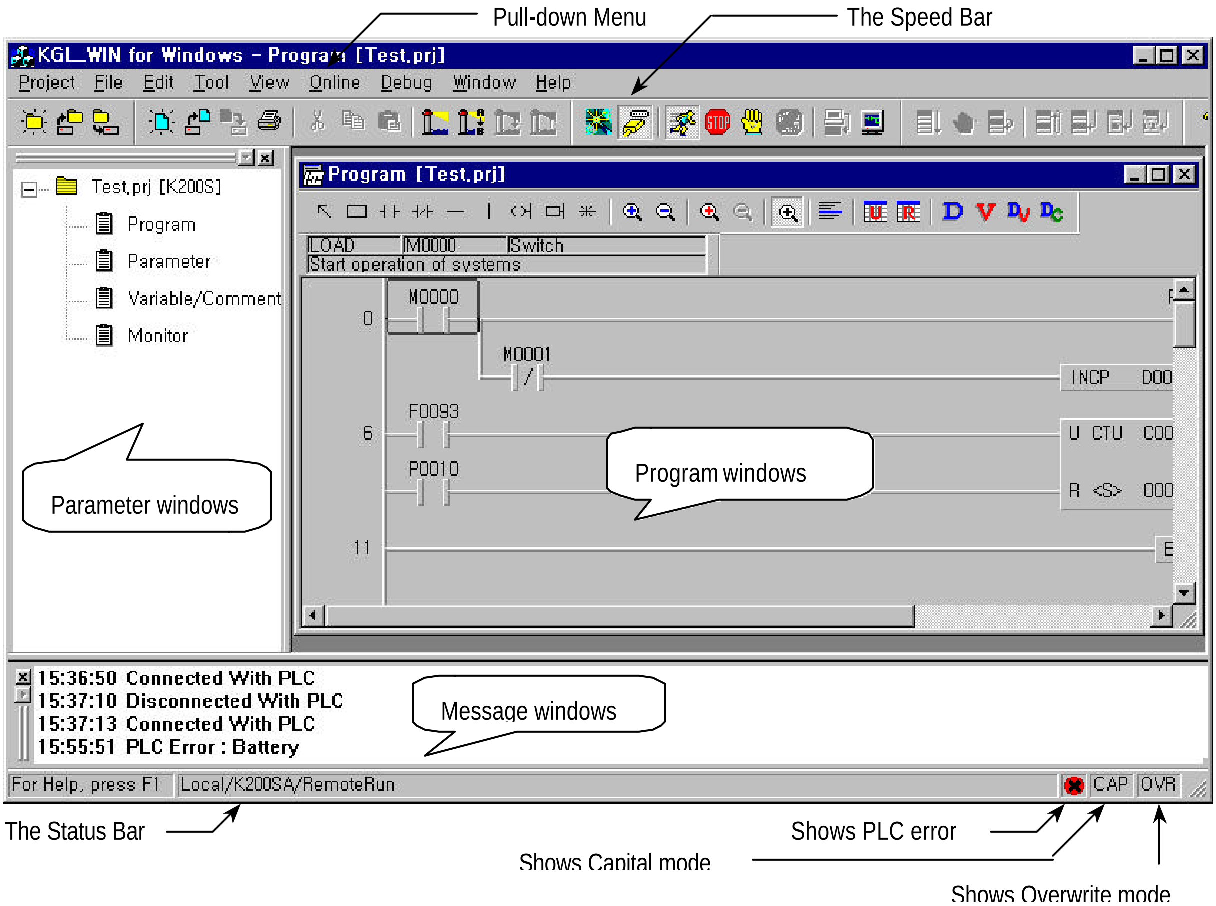
♦ Enter the Project Name (Test.prj) to save the active. If you don't enter the name, the Project will be saved as New.prj.

♦ When the Project is saved, all the Items(Program, Parameter, Variable/Comment) are stored in the Project including the status of the window arrangement.

3. 5 The Screen Setup and Functions

3. 5. 1 The Screen Setup

♦ The main Screen of KGLWIN



♦ The Status Bar

→ Description Mode : Describes the Function of the Command or Menu.

→ PLC Mode : Shows the Connection Status, PLC Type, Depth of Connection, PLC Operating Mode, View Mode, Monitoring Mode and more.

3. 5. 2 Menu

♦ To perform an item (command) in Menu, you can select the Command in Pull-down menu or the icon in the Speed Bar.

♦ The Menu Bar provides two ways for you to access the Pull-down menus. Once the Pull-down menu appears, You can access the menu items in the same way by either using the mouse or pressing the underlined letter (Project..)

In order to execute a command by the underlined character in the menu list, press the <ALT> key first, and then press the letter.

1) Project

Commands		Descriptions
New Project..		Create a new Project
Open Project..		Open an existing Project
Save Project		Save the active Project
Save Project As...		Save the active Project as a new Project
Close Project		Close the current Project
Save Item	▶	Save Program, Parameter and Variable/Comment as Files
Load Item	▶	Load Program, Parameter and Variable/Comment files in a Project
Options...		Set KGLWIN Options
Print...	Ctrl+P	Print the active document
Print Preview		Preview documents to print
Project Print		Print all the contents of the Project
Print Setup...		Setup the Printer Options.
Recent Project		Open the recent Project
Exit		Quit the application

2) File

Commands		Descriptions
New...	Ctrl+N	Create a new File
Open...	Ctrl+O	Open an existing File
Save	Ctrl+S	Save the active File
Save As...		Save the active File as a new File
Recent File		Open the recent Files

3) Edit

Commands		Descriptions
Cut	Ctrl+X	Remove the selected block and send it to the Windows clipboard
Copy	Ctrl+C	Copy the selected block to the Windows clipboard without affecting it
Paste	Ctrl+V	Retrieve it from the Windows clipboard
Delete	Ctrl+Delt	Delete the selected block
Insert Line	Ctrl+M	Insert a line at a caret position
Delete Line	Ctrl+U	Delete a line at a caret position
Edit Rung Comment		Edit a Comment at a specified rung
Block Selection...		Select a block using Step range
Optimize Program		Optimize the program
Find...	Ctrl+F	Find the specified string
Replace	Ctrl+H	Find the specified string and replace it a new device
Forward Again	Ctrl+F3	Search again forward
Backward Again	Ctrl+B	Search again backward.
Go to Step	Ctrl+G	Move the cursor to the step

4) Tool (Only available for Ladder Program)

Commands		Descriptions
Arrow		Go to Arrow mode
Range		Set the range for block
Normally Open Contact	F3	Select a Normally Open Contact
Normally Closed Contact	F4	Select a Normally Closed Contact
Horizontal Line	F5	Select a Horizontal Line
Vertical Line	F6	Select a Vertical Line
Output Coil	F9	Select a Output Coil
Applied Instruction	F10	Select an Applied Instruction
NOT Instruction		Select a NOT Instruction

5) View

Commands		Descriptions
Mnemonic/Ladder	Ctrl+Space	Change the program to Ladder or Mnemonic Mode
Device Name		Display the Device Name
Variable Name		Display the Variable Name.
Device+Variable Name		Display the Device and Variable Name
Device+Comment		Displays the Device and Variable Name
Used Device		Display the Used Device
Device Reference		Show the Device Reference
Check Program...		Check the errors in the Project
Change No of Column		Change the number of the input contact in one line
Zoom In/Out		Zooming

6) Online

Commands		Descriptions
Connect+Download+Run +Monitor Start	Ctrl+R	Execute Transfer, Run and Monitor Functions simultaneously
Connect		Connect to PLC
Disconnect		Disconnect from PLC
Monitor Start		Start Monitoring
Mode Change	Run	Change PLC Mode to Run
	Stop	Change PLC Mode to Stop
	Pause	Change PLC Mode to Pause
	Debug	Change PLC Mode to Debug
Read Information	System Monitor	Monitor ON/OFF status of I/O modules
	PLC Information...	Show PLC Type, PLC Version, Memory Pack and Scan Time
	I/O Information...	Show type of modules and O/S version number of special modules
	Link Information...	Show the slot number of Network modules
	Mnet Information...	show the slot number of Mnet module
	HSLink Parameter	Monitor High Speed Link Parameter
Write Information	Set PLC Clock...	Set PLC Clock
	Change Password...	Change the Password in PLC
	Write Mnet Parameter...	Change the Parameter of Mnet
	FSM Emergency Output	Setup the device for an emergency output

Download...		Download Program/Parameter to PLC
Upload...		Read Program/Parameter from PLC
Verify ...		Verify Program/Parameter with PLC
Clear	Data...	Clear Devices in PLC
	Program/Parameter	Clear the program/parameter in PLC
Flash Memory	Read	read the program/parameter from Flash Memory
	Write	write PLC program/parameter to Flash Memory
	Verify	verify the program/parameter with Flash Memory
EPROM	Type Selection...	Select EPROM Type
	Write	write PLC program/parameter to EPROM
	Read	read the program/parameter from EPROM
	Verify	verify the program/parameter with EPROM
	Check Blank	Check if EPROM is empty
Binary File	Load Binary File...	transfer the program/parameter in KGLWIN to EPROM
	Make Binary File...	receive the Binary File from EPROM

7) Debug

Commands		Descriptions
Trace	Ctrl+T	Run only one Step
Go		Run until current Break point
Stop		Stop Debugging
Break Step...		Run to the specified Break Step
Break Scan...		Run to the specified Break Scan
Break Bit...		Run until the specified Bit is set
Break Word		Run until the specified Word data
Change Current I/O...	Ctrl+I	Change Current I/O
Forced I/O Enable		Enable Forced I/O setting
Set Forced I/O...		Set Forced I/O
Sampling Trace		Execute sampling Trace
Trigger		Execute Trigger

9) Window

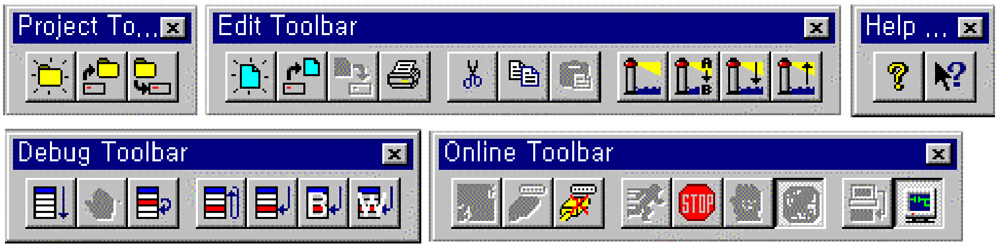
Commands	Descriptions
New Window	Open a new window for the active program
Cascade	Cascade windows on the screen
Tile Horizontally	Arrange window as non-overlapping tiles
Tile Vertically	Arrange window as non-overlapping tiles
Arrange Icons	Arrange icons at the bottom of the window

10) Help

Commands	Descriptions
KGLWIN Help	Display help topics of KGLWIN
Help in Help	Display detailed instructions about how to use
About KGLWIN...	Display general information of KGLWIN

3. 5. 3 Tool Bars

◆ These Tools are supported in KGLWIN.



◆ The Tools in the Speed Bar

Tools	Commands	Tools	Commands
	New Project		Connect
	Open Project		Disconnect
	Save Project		Download
	New File		Monitoring Mode
	Open File		Run
	Save File		Stop
	Print		Pause
	Cut		Debug
	Copy		Go
	Paste		Debug Stop
	Find		Trace
	Replace		Break Scan
	Forward		Break Step
	Backward		Break Bit
	Conncet+Dowload+Run+Monitor Start		Break Word

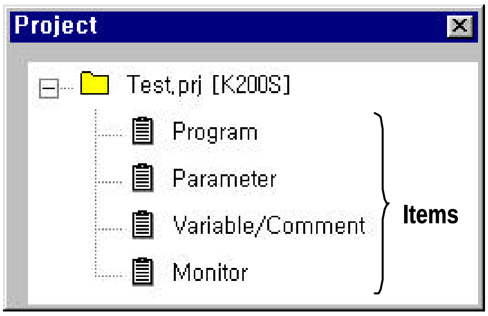
Chapter. 4 Creating a Project

Chapter. 4 Creating a Project

4. 1 Create a Project

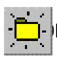
4. 1. 1 About a Project

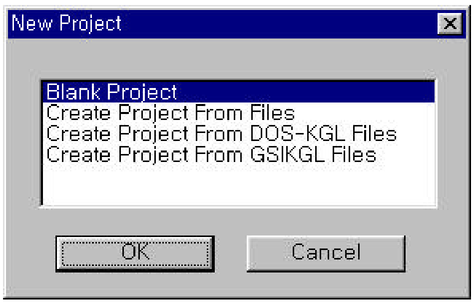
- A Project is the highest level to communicate with PLC and KGL for Windows.
  A Project consists of Program, Parameter and Variable/Comment of Device.



- KGL for Windows deals with User Defined Programs and includes all elements necessary for describing a Project.
- A Project consists of 3 Items (Program, Parameter and Variable/Comment) and Monitoring is activated when the Monitoring Window is opened. Each Item can be saved respectively for another Project.
- Saved Items (Program, Parameter and Variable/Comment) can be used for creating other Projects or to reuse for other Projects.
- A Project includes not only Program, Parameter and Variable/Comment, but also PLC type, Used status of KGL and various information registered for monitoring. Thus, When you reopen the Project after saving a Project, the Window keeps the previous working condition.
- Only Program and Parameters can be downloaded to PLC.
- A Project is saved as *.PRJ File.

4. 1. 2 Create a Project

- To create a New Project file, Select **File--New Project...** (m the Project pull-down Menu.
  The New Project dialog box will appear as below.

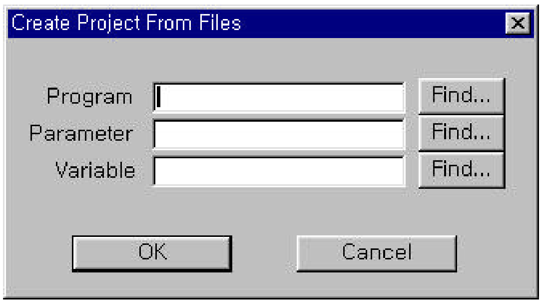


- Open a Blank Project

→ It creates a new Project. (Refer to Chapter. 3.1)

- Create from Old Files

→ To create a New Project using the already existed Item (Program or Parameters or Variable/Comment), Select Item or items to be used by clicking the Find button in the dialog box.



→ Click OK button after registering Items.

→ Up to 3 items can be selected and non-selected items are set to default(Initial data).

- After selecting PLC Type and Programming Language, press the OK button. Then Project, Message and Program Windows will be opened.

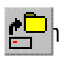
- Create from DOS KGL file

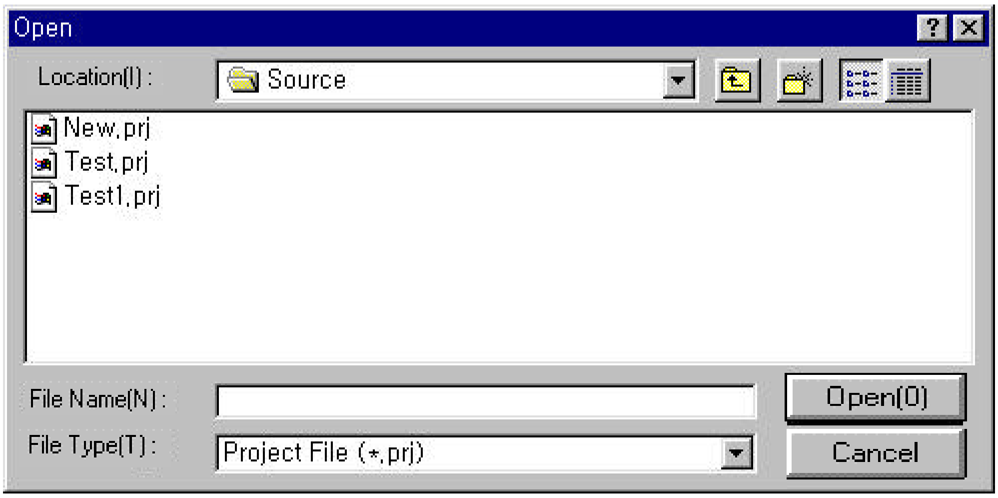
→ To create a New Project using Items (Program, Parameter and Variable/Comment) created in KGL for DOS, Select PLC Type and Programming Language after selecting already created Items in KGL for DOS. Then, a New Project will be opened.

- Create from GSIKGL file

→ To create a New Project from GSIKGL file, Select already created files (*.PGM, *.CMT) from GSIKGL in the dialog box and select PLC Type and Programming Language.

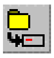
4. 2 Open a Project

- To open an existing Project, Select **Project–Open Project...** ( in the Project pull-down Menu.



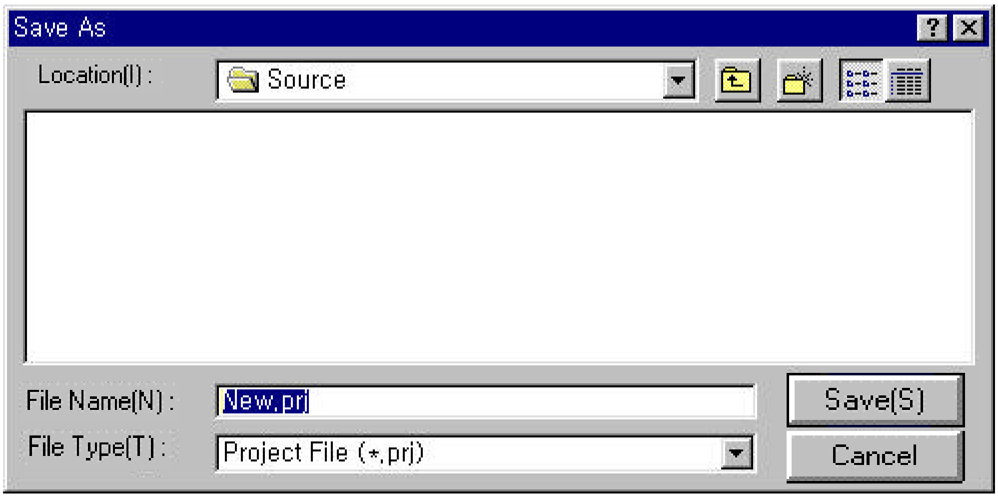
◆ Press Open button after selecting the Project that you want.

4. 3 Save a Project

◆ To save a Project, Select **Project–Save Project…** ( from the Project pull-down Menu. All Items (Program, Parameter and Variable/Comment) contained in the Project will be stored at the same time.

◆ If you overwrite an already existing project onto itself, there will be no message on screen.

◆ If you save a New Project that is not existed in the specified folder or select **Project–Save as…** from the Project pull-down Menu, the software will reconfirm it as below.

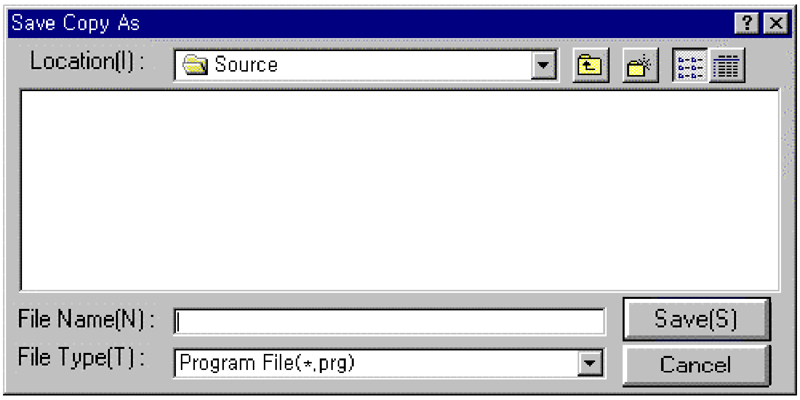


◆ Select **Project–Close Project or Project–Exit** from the Project pull-down menu. Then, the Window asking if you save the Project will appear. Click ' Yes' button to save the edited Project or ' No' button not to save.

4 . 4 Manage an Item

4 . 4. 1 Save an Item

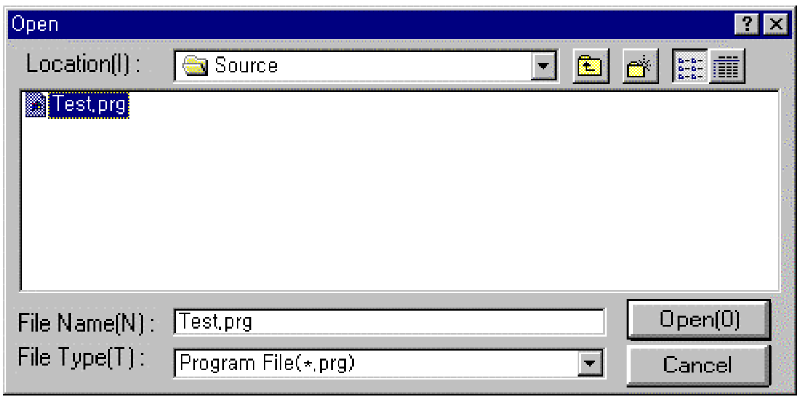
- In order to save each Item included in a Project, select **Project–Save Item...** from the Project pull-down Menu.



- Press Save button after entering the name of the Item.
- This can be used for creating a New Project or changing Items of a project.

4. 4. 2 Load an Item

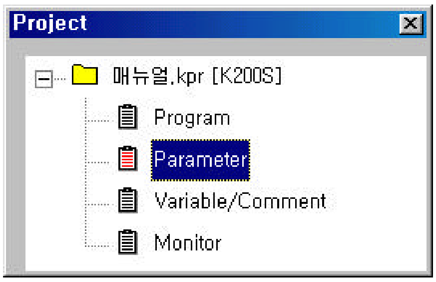
- In order to load some items to the on-editing project from the saved item file, select **Project–Load Item...** from the Project pull-down Menu.
- Click Open button after selecting item in Open dialog box as below.



- After the completion, the program among Items of the Project will be changed into Test.prg file.

4. 5 Editing a Parameter

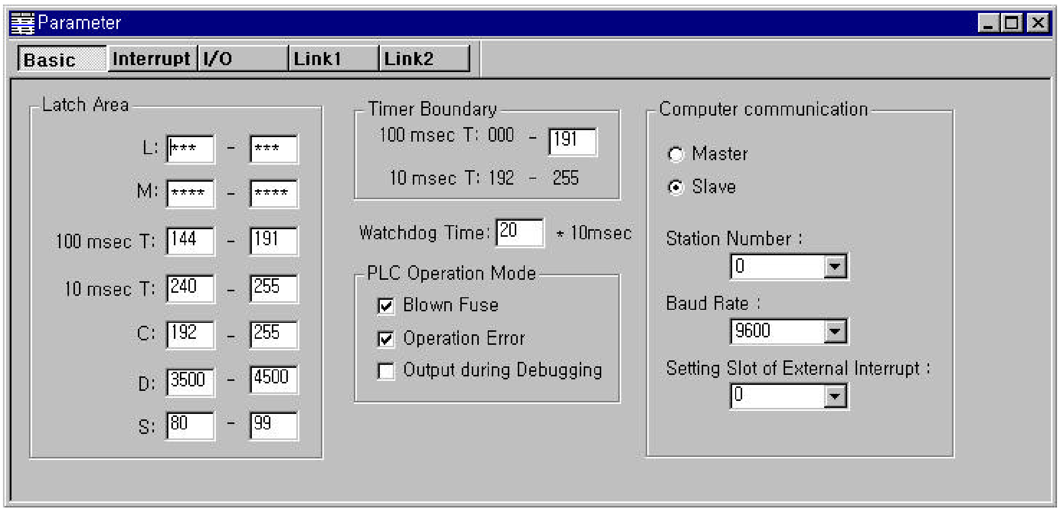
- In one Project, There are 4 types of Parameters, 'Basic Parameter' 'Interrupt Parameter' 'I/O Parameter' and 'Link Parameter' To perform parameters, you should download them to PLC.
- Select Parameter in Project Window.



- For setting up Parameters, please refer to the manuals.

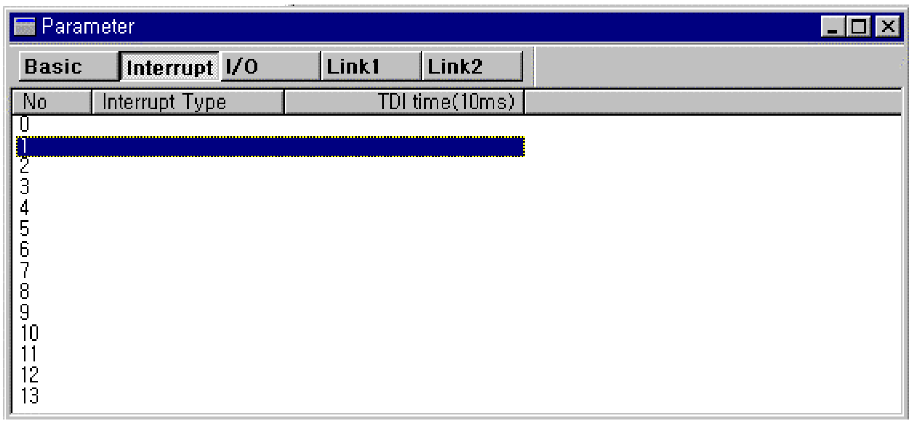
4. 5. 1 Basic Parameter

- To setup Latch Area of Devices, Timer Boundary, Watchdog Time, PLC Operation Mode or Baud Rate, select Basic Parameter in Parameter window.

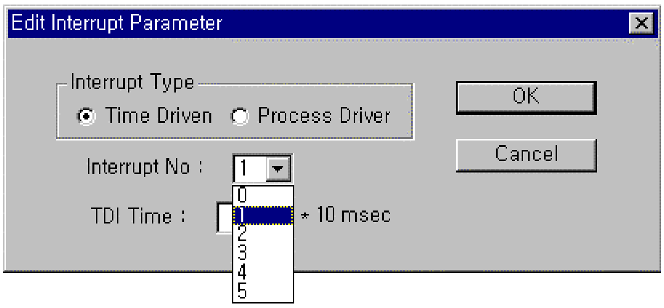


4. 5. 2 Interrupt Parameter

- Select Interrupt Parameter in Parameter window.
- Double-click the number that you want to setup.



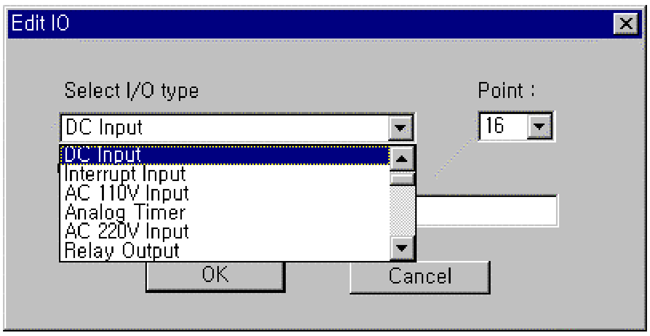
- Select Interrupt Type and Interrupt number and Interval.



- TDI Time is interval times, which is available to set within the range of 10 ~ 6000msec
- To finish interrupt parameter settings, click the OK button.

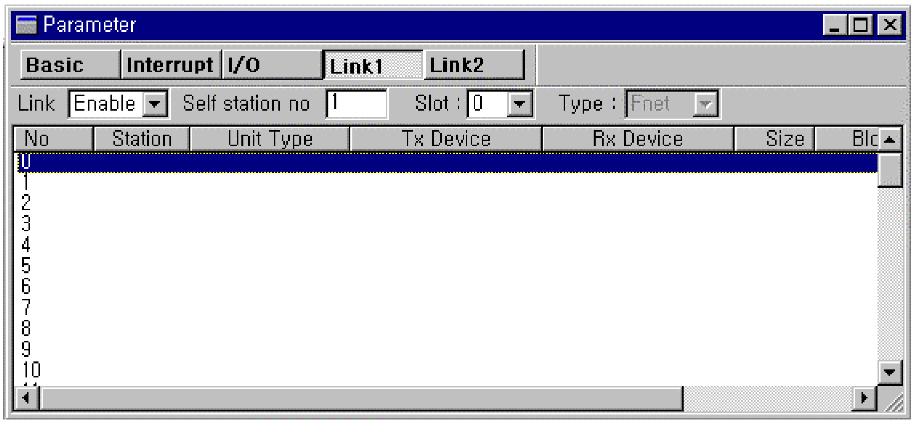
4. 5. 3 I/O Parameter

- To reserve the slot number and I/O Type in PLC, select the I/O Parameter in Parameter window.
- Select I/O Type and enter the comment.

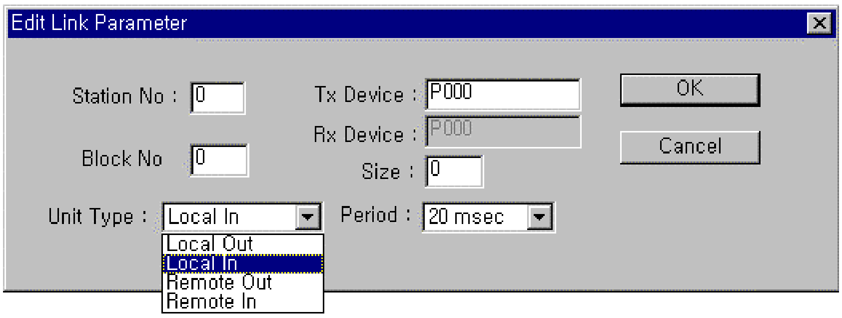


4. 5. 4 Link Parameter

- Select Link number to setup in Parameter window.



- Setup Link Enable, Slot number, Self-station and Type of network in Link Parameter and double-click the relevant number.
  Then the following dialog box for setting the parameter.

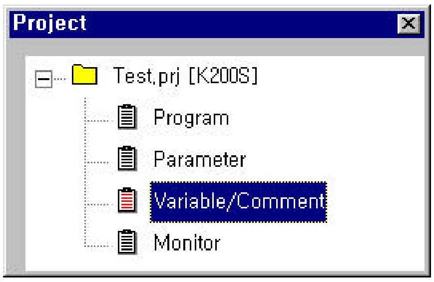


- Click OK buttons after setting the data.
- For more information about Link Parameter, please refer to manuals for the communication modules.

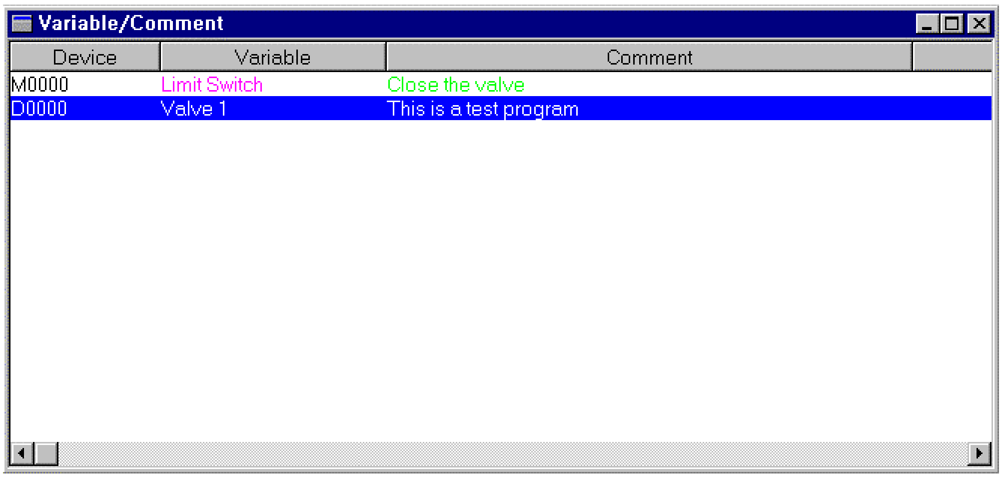
4. 6 Editing a Variable/Comment

♦ Variable/Comment is for the detail description of devices used in PLC. This also makes you understand the process of a Project more easily.

♦ Select Variable/Comment in Project window.

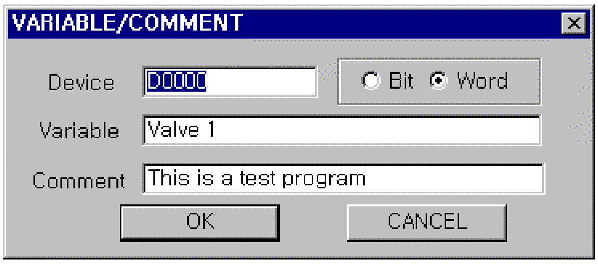


♦ Double-click the Variable/Comment in Project window.



♦ Enter Variables in the dialog box and setup the types of Variables (Word/Bit).

♦ Enter Variable Name or Comment Name in the dialog box.



♦ To exit the dialog box, click OK button.

Chapter. 5 Editing a Program

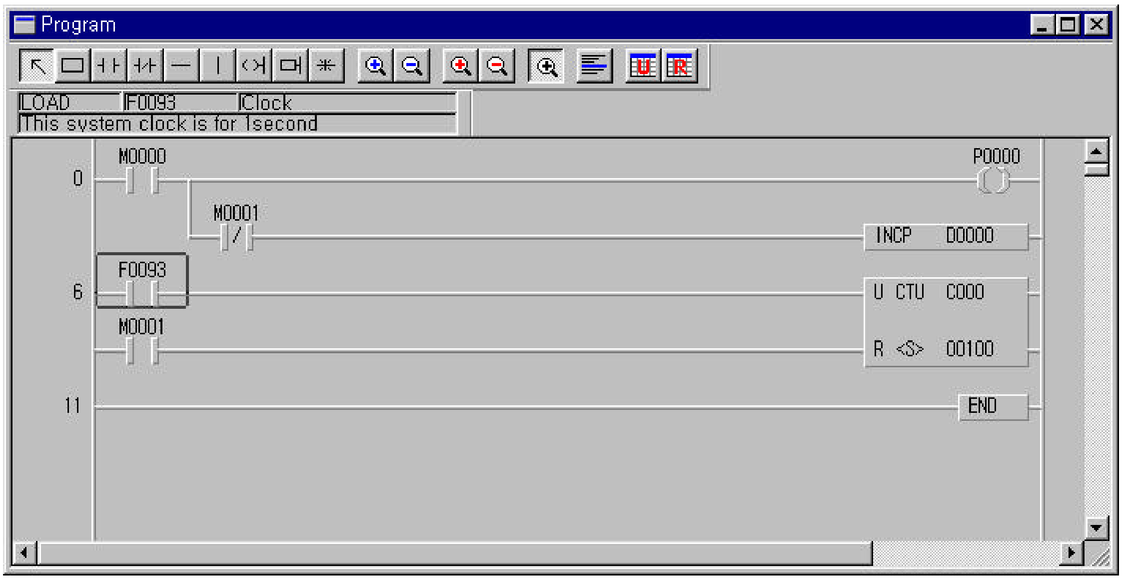
Chapter. 5 Editing a Program

◆ A Program is used for editing and developing Commands to control a machine or process by PLC System.
This chapter shows creating, saving and editing a Program.

5. 1 Edit a Ladder program

◆ A program is included in a Project as an Item of it and is created automatically in a Project.

◆ Open the Test .prj created in Chapter. 3.1.

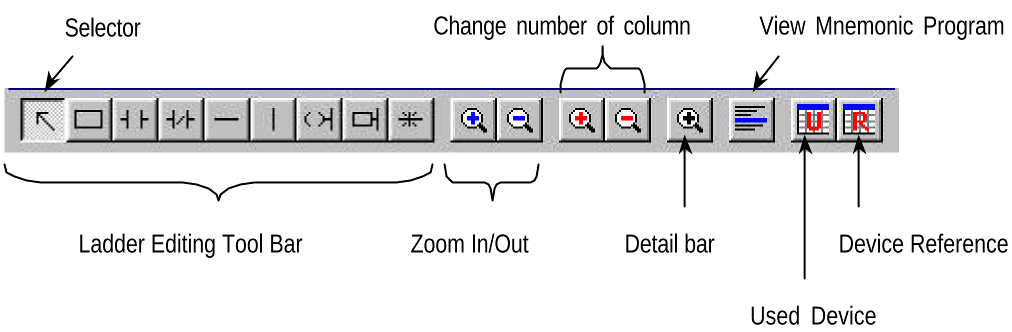


¨ **Tool Bars**

◆ Ladder Tool Bar

→ This Tool Bar is only visible when you are in a Ladder Program editing mode.

In the case of Ladder editing tool bar, you can also use this function in **Tools** Menu in the Main pull down menu



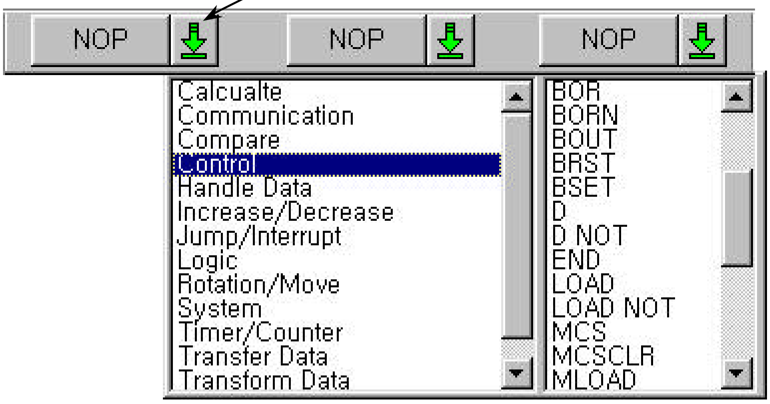
◆ Detail Bar

→ This Bar shows the used Command and Variable/Comment of the used Device where the cursor is placed.



◆ Instruction List Bar

→ To select the Instruction List Bar, move the mouse pointer into an area of the illustrations below, then click the right mouse button in the Tool Bar.

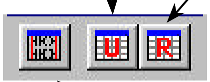


→ You can install the instructions that are used frequently into these Instruction List Bars. To use the Instruction registered in the Instruction List Bar, Just click the specified Instruction List Bar. Then, the instruction will be entered in the position.

5. 2 Edit a Mnemonic program

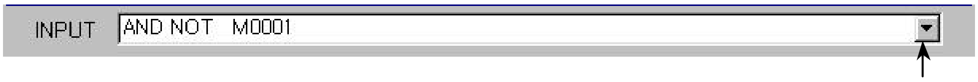
◆ A Mnemonic Program uses the Input Bar for Instruction Input.

◆ Mnemonic Tool Bar



◆ Input Bar

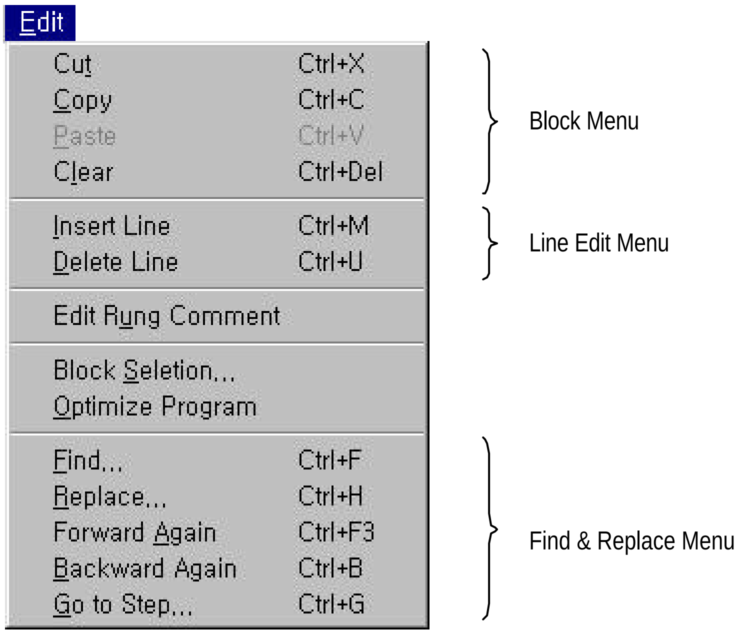
→ The Input Bar shows Instructions where the cursor is placed on and you can also edit or insert a Program using Insert/Overlap Mode.



◆ Instruction List Bar

→ This executes the same function as the one in the Ladder program.

5. 3 Edit Menu



◆ Block Menu

→ Cut(Ctrl+X), Copy(Ctrl+C) and Paste(Ctrl+V) are only available after selecting a Block.

◆ Line Edit Menu

→ Inserts or deletes a line where the cursor is placed.

◆ Edit Rung Comment

→ Edits the Rung Comment in the specified line.

◆ Block Selection...

→ Selects a Block by a step number.

◆ Optimize a Program

→ Optimizes a Program by deleting NOP or unnecessary lines.

◆ Find... & Replace... Menu

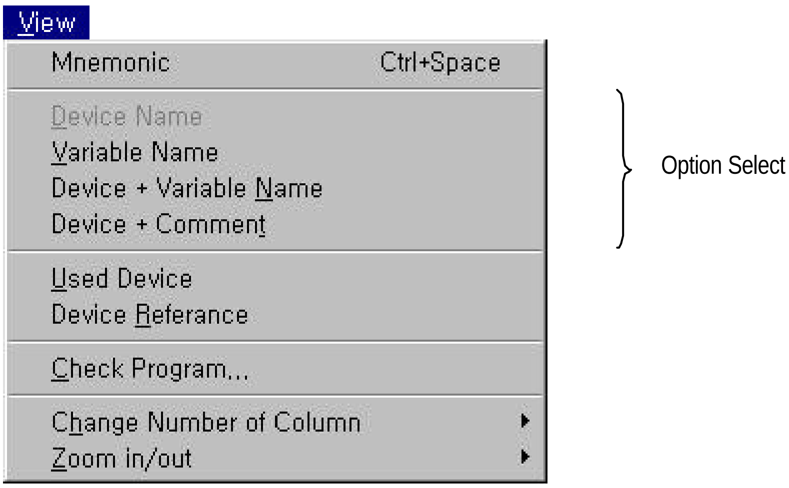
→ Used to find or replace a specific Operand.

5. 4 Pop-up Menu

- Click a right mouse button to see a Pop-up Menu.
- Pop-up Menu varies according to the position of the mouse.
- The Functions are almost same as the Main Menu. But, Functions for **forced I/O Enable** operates differently.

5. 5 View Menu

- Select **Menu - View** in the Pull-down menu.



5. 5. 1 View Device

You can select only one view among 4 types.

- Shows the Device and Variable/Comment that used in the Program.

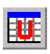
→ Device Name : Displays the Device Name on the screen. (For example, P0010, D0100)

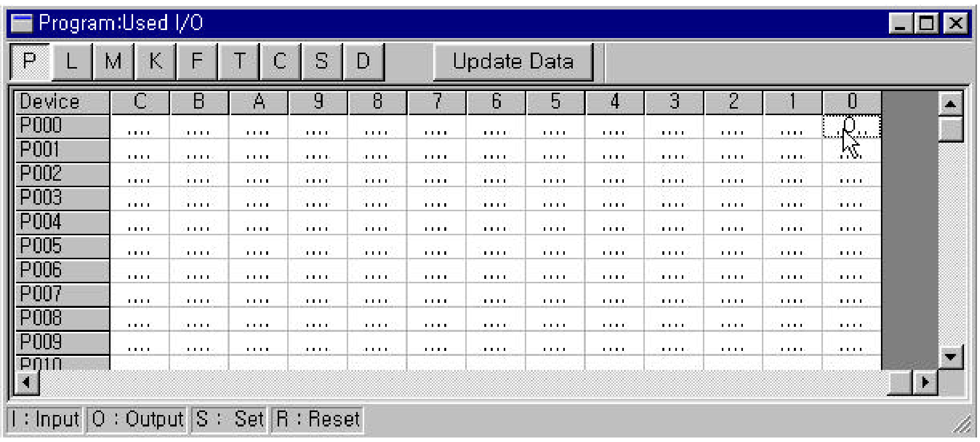
→ Variable Name : Displays the Variable Name registered in Variable/Comment Item.

→ Device + Variable Name : Displays the Device Name and Variable Name.

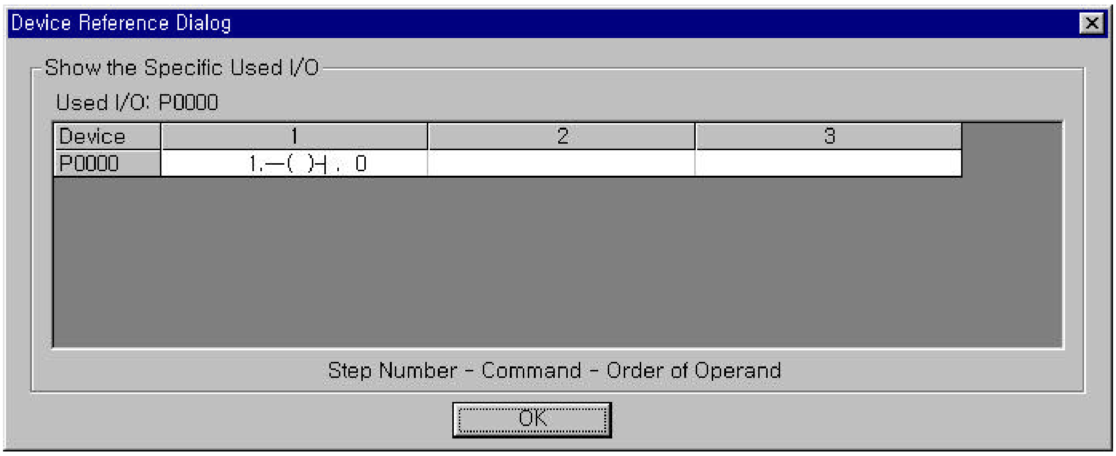
→ Device + Comment : Displays the Device Name and Comment.

5. 5. 2 View Device Information

- Select **Menu - View – Used Device** ( in the pull-down menu.

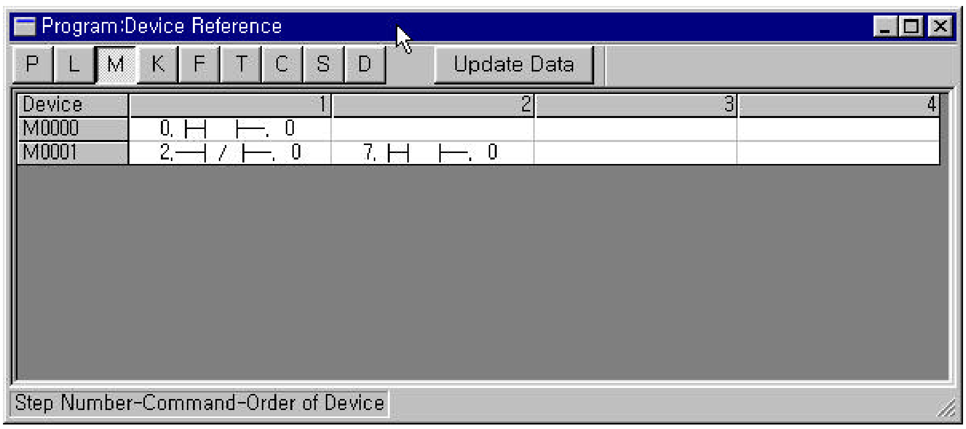


- ♦ A Region Bar is used for selecting the Device Region to be monitored or to be updated.
- ♦ For the detail information of the used Devices, move the mouse pointer to the position you want to monitor and click the right mouse button. Then, the Device Reference Dialog box for the specified Device appears.



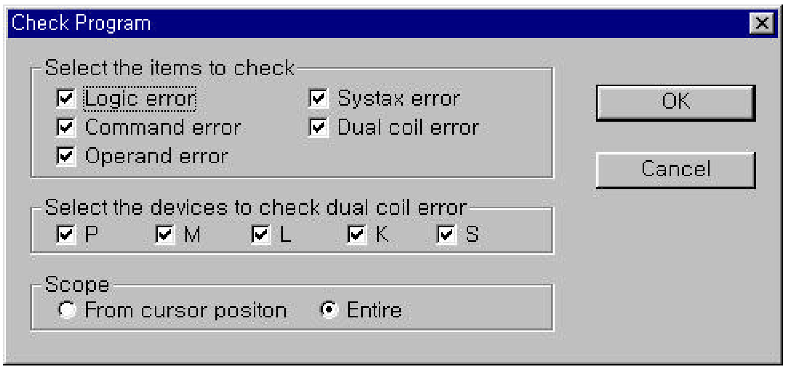
- ♦ The Device Reference Dialog box shows the step number, command and used status of the used Devices.
- ♦ You can also select the function from **Menu - View – Device Reference(** the pull-down menu.

This shows all the used Devices for each Device.



5. 5. 3 Check a Program...

- Program Check Function shows logic errors, operand errors, dual coil errors and more.
- Select **Menu - View – Check Program...** in the pull-down menu.

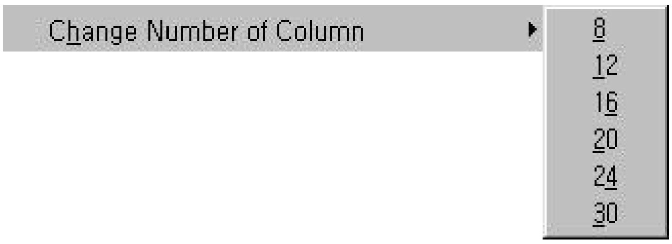


- You can select the items to be checked in the dialog box. Press OK button to execute.
- After checking, the result message appears. If there is an error, the message window will show you the detail information.

5. 5. 4 Change Number of Column

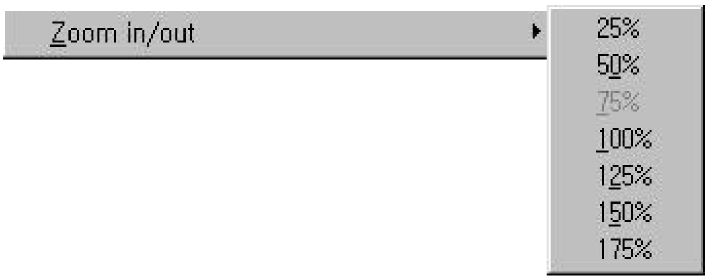
- To change the number of input that can be inserted in one line of Ladder program,

Select the number of input contact in **Menu - View – Change Number of Column** (, ) i  e pull-down menu. (red ones)



5. 5. 5 Zoom In/Out

- You can enlarge or reduce the screen by clicking on  or  ttons.(blue ones)
- You can change the zoom level by selecting **Menu - View – Zoom In/Out** in the Pull-down menu.

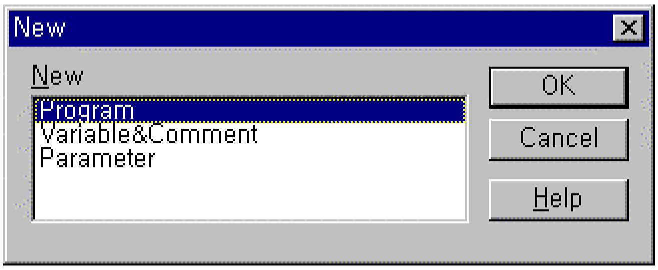


5. 6 Manage a File

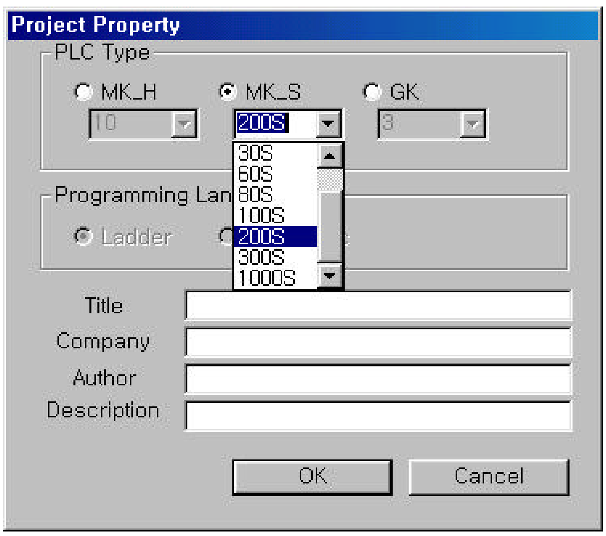
- With creating a Project, 3 Items (Program, Parameter and Variable/Comment) are created automatically at the same time.
- These Items are stored in one project. If you want to save the each files separately, select **Project – Save Item** in the pull-down menu.
- An **Item** means a Program or Parameters or Variable/Comment in one Project. To use Items in other projects, The items should be saved as each file.
- A **File** means a Program, Parameters or Variable/Comment that does not included in a Project as an item. If you use a file in a Project, the file will be changed into an Item.

5. 6. 1 New...

- To create a new file, select **Menu - File – New...**( the pull-down menu.

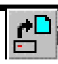


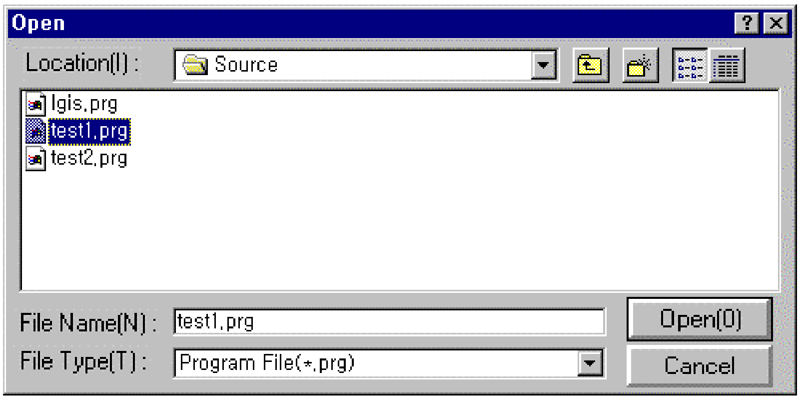
- Select an Item (Program) to create and press OK button.



- Setup PLC Type and Programming Language and press OK button.

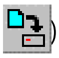
5. 6. 2 Open...

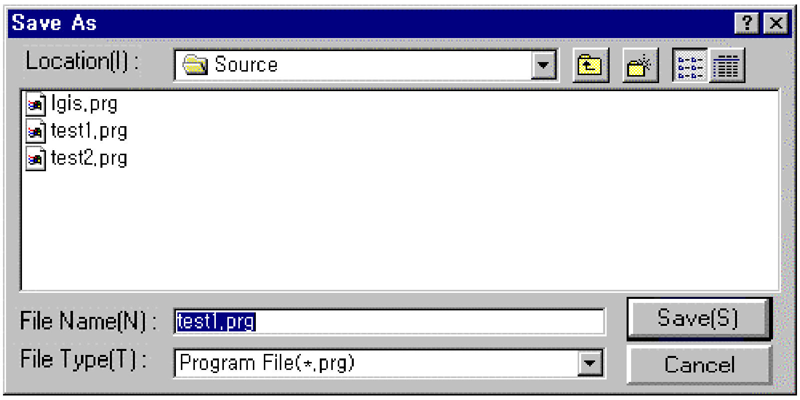
- To open a file, select **Menu - File – Open** ( in the pull-down menu.



- Select a File Name and Type and press Open button.

5. 6. 3 Save, Save As...

- To save a file, select **Menu - File – Save** () in the pull-down menu.
- To save a file as a different name, select **Menu - File – Save As...** in the pull-down menu.



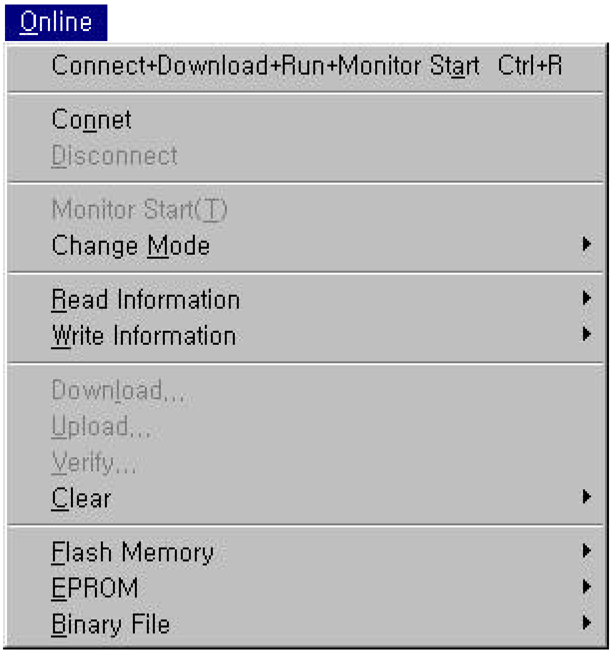
- Type the File Name to be saved and press Save button.

Chapter. 6 Online

Chapter. 6 Online

♦ Online Function is used for the communication between PLC and KGLWIN.

Select Online in the Pull down menu



♦ In this Function, you can setup the communication conditions such as Reading from PLC, Writing to PLC, Monitoring, Debugging, PLC Mode Change, Link Parameter Setup, PLC I/O Information, Setup Enforced I/O, and Password Setup.

6.1 Connection

6.1.1 Connect + Download + Run + Monitor Start

♦ To execute the communication with PLC automatically, select this menu.

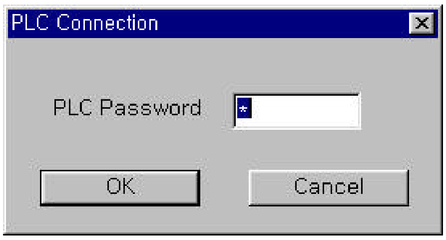
♦ This Function downloads, make PLC run and monitors the Project created in KGLWIN at one time.

Prior to perform this menu confirm that the switch in CPU module of the PLC is at **PAU/REM** (Remote Stop) mode.

If the key is at **STOP** mode, only Connect + Download commands will be performed

6.1.2 Connect

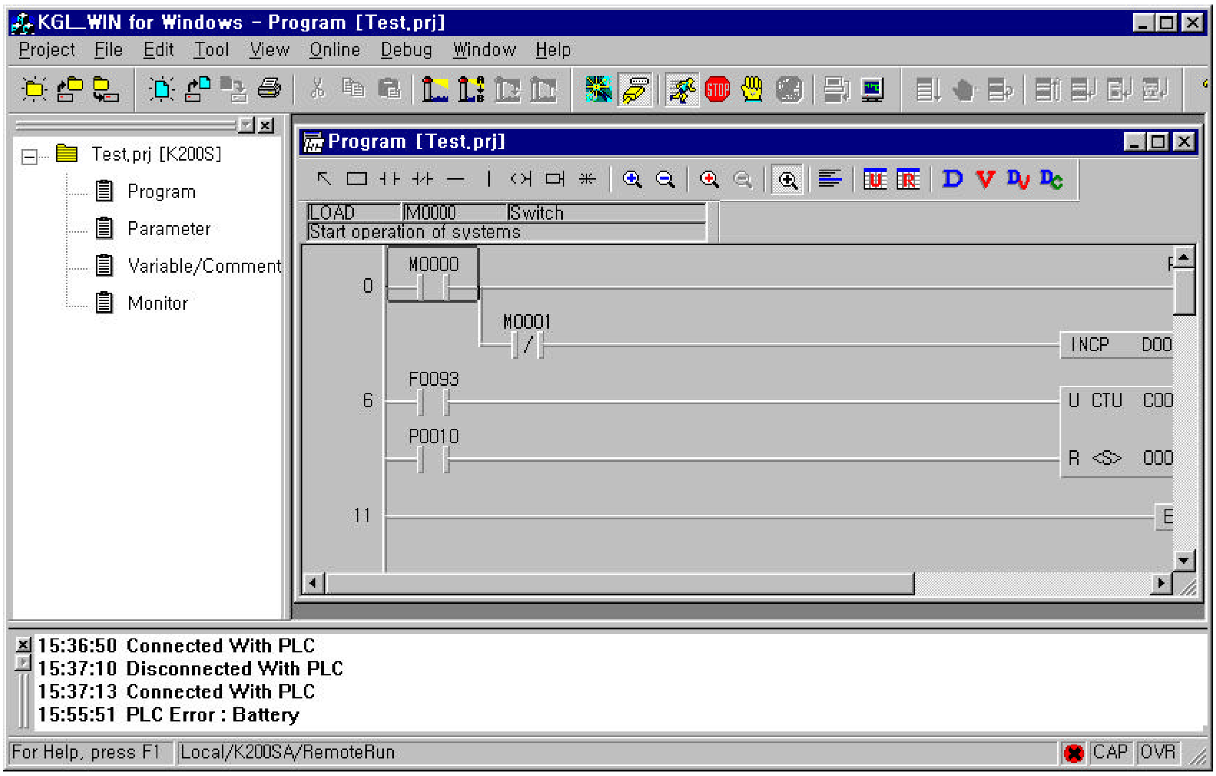
♦ Click **Connect** menu to connect to CPU module. Then, the following window will appear.



♦ Enter a password and click OK button

♦ See 6.4.2. of this manual for more detail about password.

♦ The Status Bar at the left bottom of the screen shows what is open in the Screen. Connection status, CPU Type and Key switch mode are displayed in order.



Status Bar

Shows PLC error

Shows Capital mode

Shows Overwrite mode

♦ Connection Status : Local, CPU Type : K200SA , Key switch mode : Remote RUN

6.1.3 Disconnect

♦ To disconnect the communication between PLC and KGLWIN, select Disconnect menu in Online Pull- down menu. Then " Disconnected " Message will be displayed.

6.2 Monitoring & Mode Change

6.2.1 Monitor Start/Stop

- To monitor the Program in RUN mode, select **Monitor Start** menu in Online Pull- down menu.
- If you want to stop the Monitoring Function, select the **Monitor Stop** in Online Pull- down menu. (**Monitoring Start/Stop** is toggled)
- This function monitors only the used device in the program. If you want to monitor other devices not shown in the program, select **Monitor** in the Project Window.

6.2.2 Mode Change

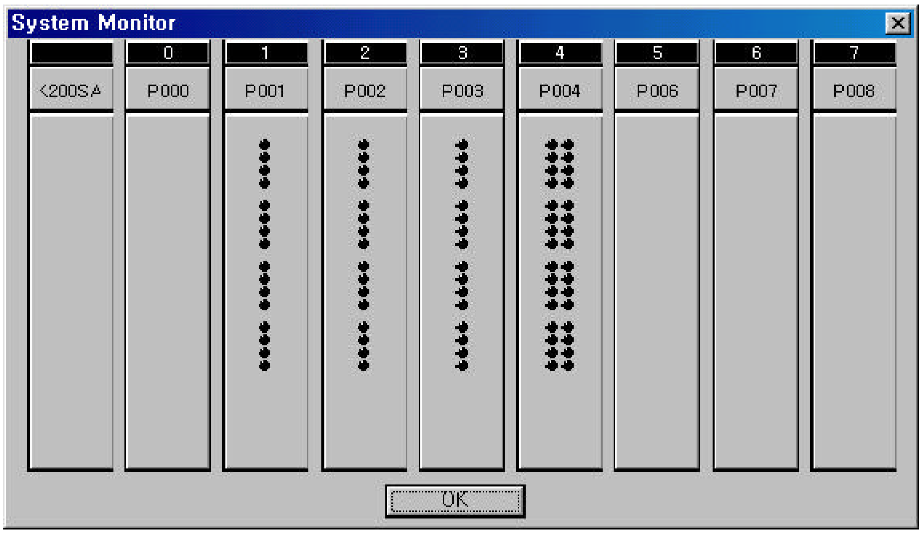
- Select **Change mode** in Online Pull-down menu.
- Run Mode : Changes PLC Mode to run.
- Stop Mode : Changes PLC Mode to stop.
- Pause Mode : Changes PLC Mode to pause.
- Debug Mode : Changes PLC Mode to debug.

6.3 Read Information

- This Function gives you various information of PLC.

6.3.1 System Monitor

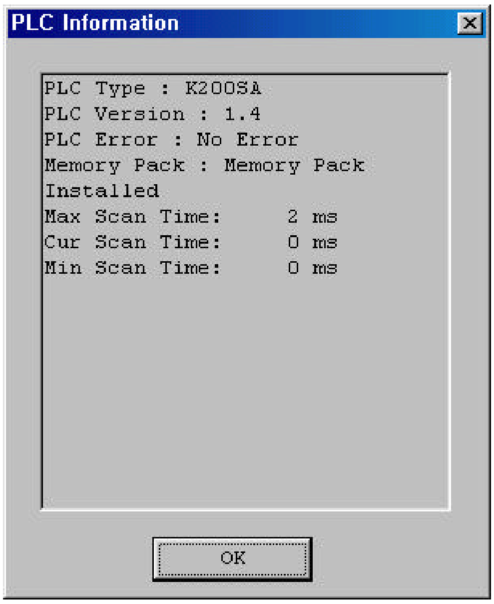
- This Function shows ON/OFF status of I/O modules.
- You can change the value of the Output module into 『ON』 or 『OFF』 by clicking the contact as below.



♦ The Expansion System can not be monitored.

6.3.2 PLC Information

♦ This Function shows PLC Type, PLC Version, Memory Pack and Scan Time.



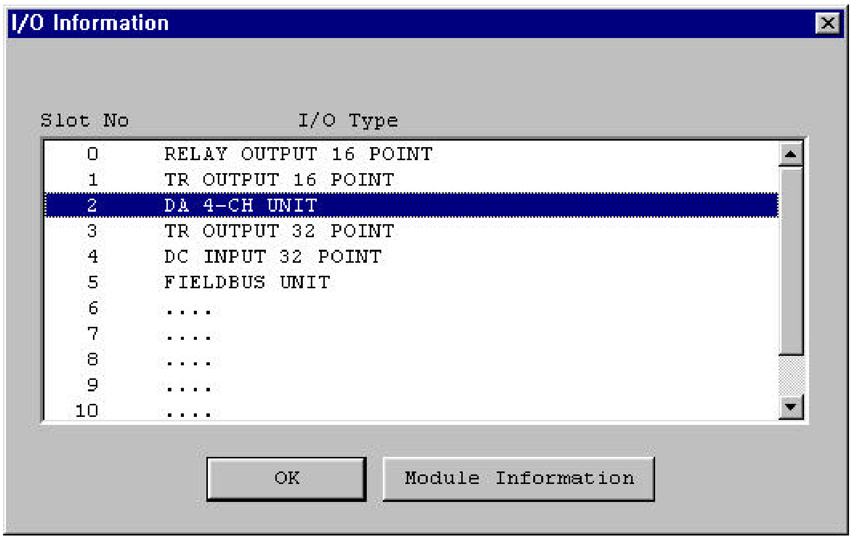
♦ Max Scan time :Indicate maximum scan time

♦ Ave Scan time : Indicate average scan time

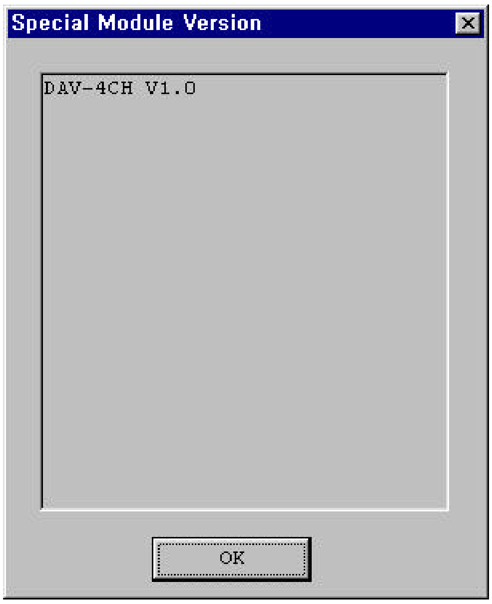
♦ Min Scan time : Indicate current scan time

6.3.3 I/O Information

◆ This function shows the type of modules and O/S version number of special modules mounted on the PLC Board.

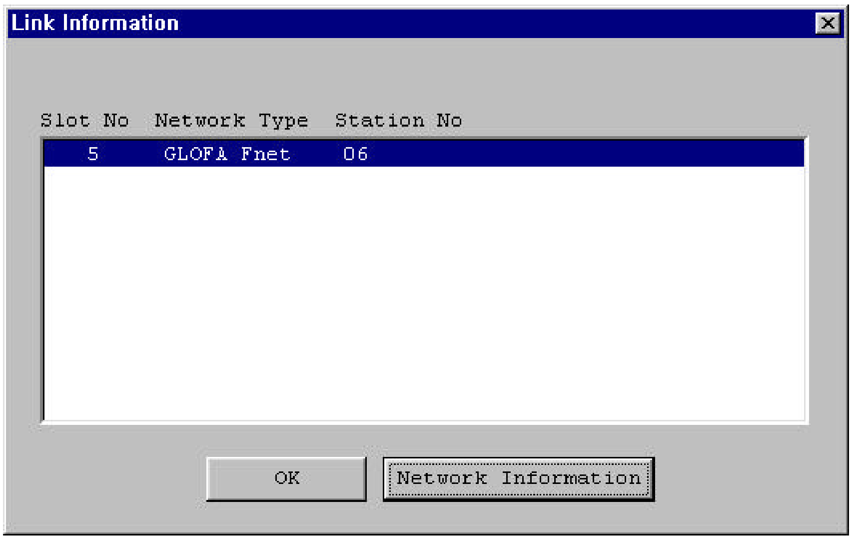


◆ Click the special module that you want to see and then select **Module information** button to see the version number of the special module.

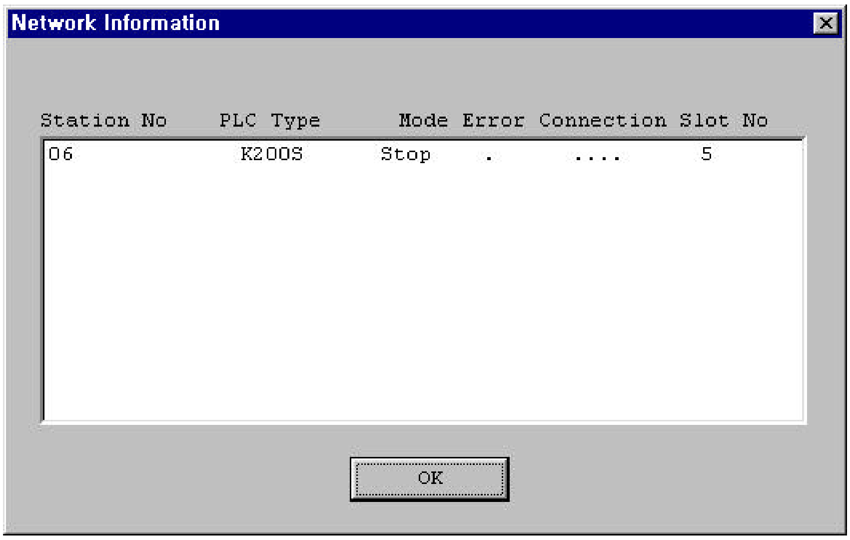


6.3.4 Link Information

◆ This Function shows the slot number of Network modules (Fnet, Mnet..), the type of Network modules and the station number. In this Function, you can also see the error status and connection status.



♦ Click the Link module that you want to see and then select **Network information** button to see status of the link module.



♦ Mode : Indicates operating status of Link module.

♦ Error : Indicates error status of Link module.

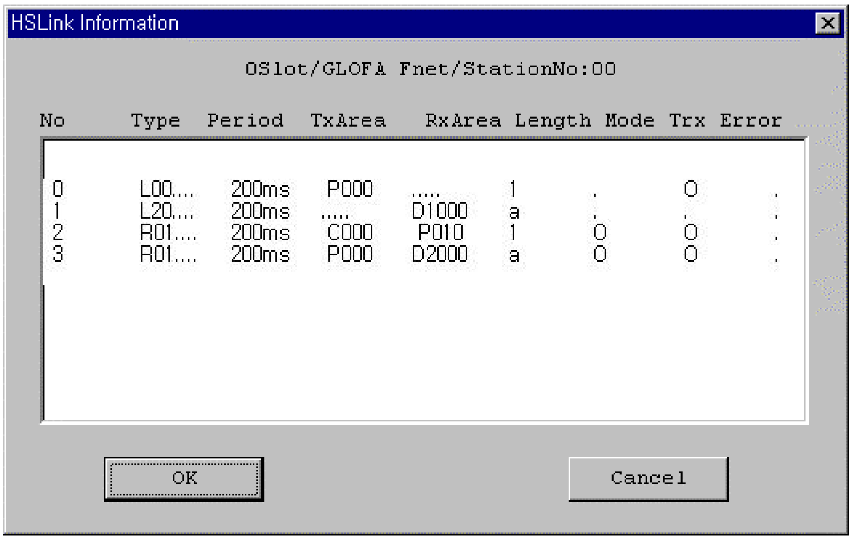
♦ Connection : Indicates connection status of Link module.

6.3.5 Mnet Information

♦ This Function shows the slot number of Mnet module, the type of Mnet and the station number.

6.3.6 HS Link Parameter

- ♦ This Function shows Parameters (Type, Period, RTX/STX Area, Length, Mode and Error).
- ♦ High Speed Link Module can be mounted up to 4 modules in New MASTER-K3 and 2 modules in GLOFA-K4 on one base board.

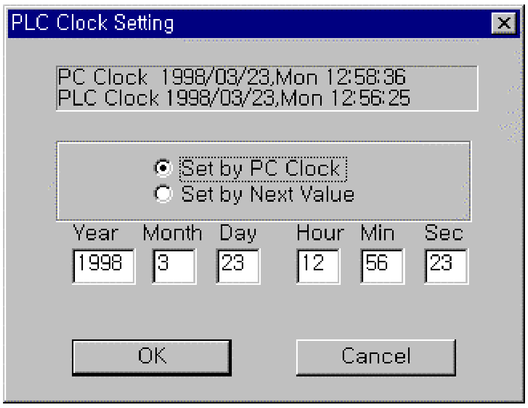


- ♦ Type means
  - ● L00.S01 : Local Send, station number 00, block number 01
  - ● L20.R11 : Local Receive, station number 20, block number 11
  - ● L01.S12 : Local Send, station number 01, block number 12
  - ● L01.R13 : Local Receive, station number 01, block number 13
- ♦ O of Mode item means communication run status and • means no connection.
- ♦ O of Trx item means normal status and O of error item means error status.
- ♦ For more information of HS Link module, please refer to User's manual of the product.

6.4 Write Information

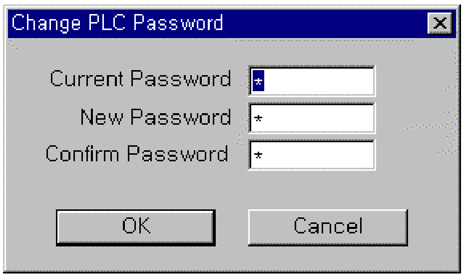
6.4.1 Set PLC Clock...

- This Function shows the Clock of PLC and PC. You can adjust the Clock. To change PLC Clock, click OK button after setting the Clock.



6.4.2 Change Password...

- In order to change a Password, type in the current password and new password. To confirm the new password, retype the password.



- If you want to erase the password, change your password into 0(zero).
- Once the password has erased, the password window will not appear anymore.
- In order to set password again, type in a new password at **Online-Write Information-Change Password** of Pull-down menu.

6.4.3 Write Mnet Parameter...

- This Function is to setup Mnet Parameter

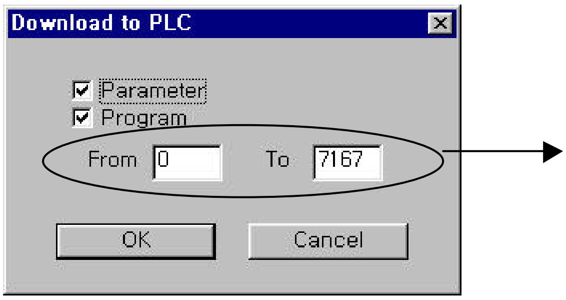
6.4.4 FSM Emergency Output..

- This Function is to setup the device for an emergency output when the communication between Remote I/O stations is stopped accidentally.
- For more information of **FSM Emergency Output**, please refer to User's manual of New MASTER-K Fnet/Mnet.

6.5 Download...

♦ This Function is to transfer the program and parameters from PC to PLC.

♦ To download the program and parameters created in KGLWIN to PLC, select **Online-Download...** in the pull-down menu.

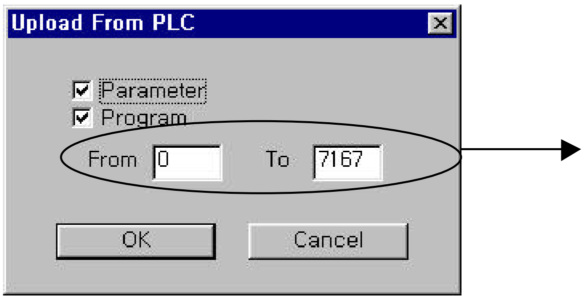


Specify step number to download a portion of program.

6.6 Upload...

♦ This Function is to transfer the program and parameters from PLC to PC.

♦ To upload the program and parameters from PLC, select **Online-Upload...** in the pull-down menu.

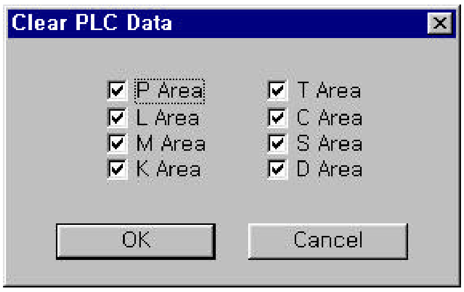


Specify step number to upload a portion of program.

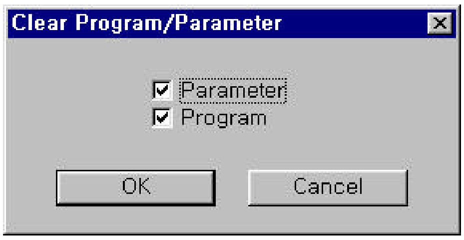
6.7 Clear

♦ This Function is only available in **Stop Mode** in PLC. To clear devices or the program/parameter in PLC, click **Data** in **Clear** menu.

♦ Confirm device areas to clear and click OK button. All device areas are cleared as default.



♦ To clear Program/Parameter in PLC, click **Program/Parameter** in **Clear** menu.



♦ Confirm items to clear and click OK button. Program/Parameters are all cleared as default.

6.8 Flash Memory

Flash Memory Menu is only available for New MASTER-K Series.

♦ To read from or write to or verify the flash memory, select the relevant menu in **Flash Memory** menu.

♦ In case of K300S/1000S Series have external flash memory module, K200S Series have internal flash memory.

K80S Series have external and internal flash memory.

♦ Flash read : This function read flash memory data to PLC. Success message box is below.



♦ Flash write : This function write PLC data to flash memory . Success message box is below.



♦ Flash verify : This function verify PLC data with flash memory data. Success message box is below.



♦ Write to External memory : This function write PLC data to flash memory. Only available for K80S Series.

6.9 EPROM

- ♦ **EPROM** Menu is only available for MASTER-K Series.
- ♦ To read from or write to or verify the EPROM, select the relevant menu in **EPROM** menu.
- ♦ If you choose **Type**…in **EPROM** menu, you can select EPROM Type.

6.10 Binary File

- ♦ **EPROM** Menu is only available for MASTER-K Series.
- ♦ To transfer the program/parameter in KGLWIN to EPROM or to receive the Binary File from EPROM, select **Binary File** menu.

→ Click **Load Binary File…** in **Binary File** menu to upload the program/parameter from Binary File.

→ Click **Make Binary File…** in **Binary File** menu to download the program/parameter to Binary File.

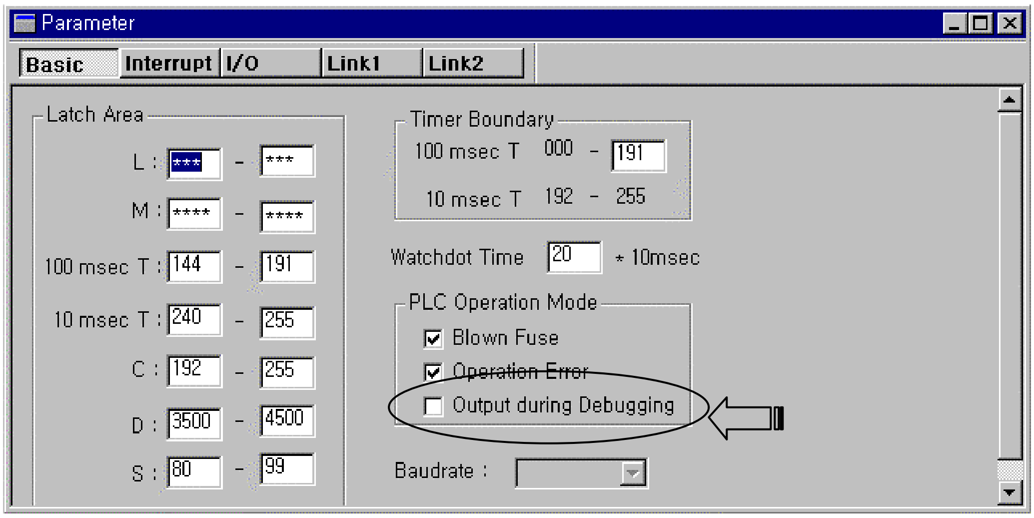
Chapter. 7 Debugging

Chapter. 7 Debugging

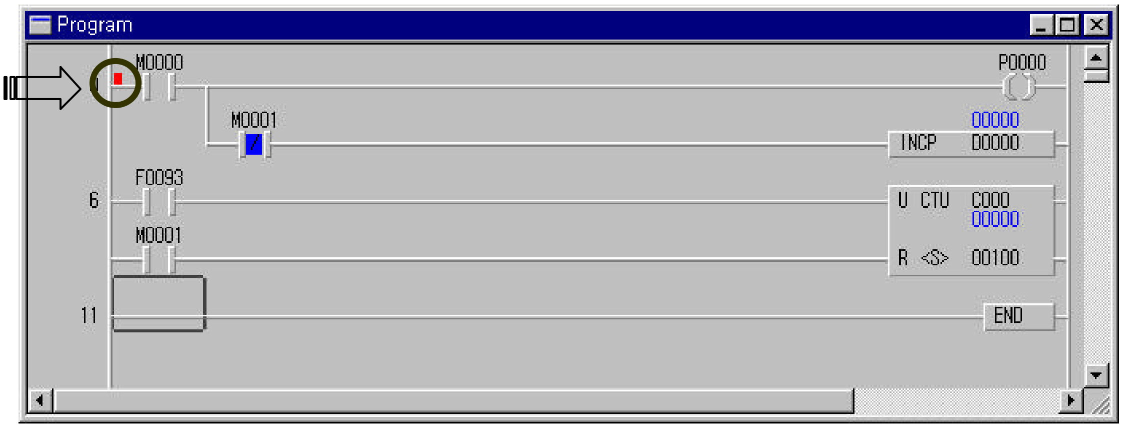
- Debugging Function is to detect errors in a program and clear the errors for the normal operation.
- In order to enter a debug mode, the following modes must be satisfied.

1) Set the switch in CPU module to PAU/REM(Remote Stop) mode
2) Stop the PLC operation from **Change mode** in Online menu.
3) The program in PLC and the one in KGL for Windows must be verified.
4) Select **Monitor Start** in Online menu.

- To enable the output during Debugging, choose the check box for **Output during Debugging**.

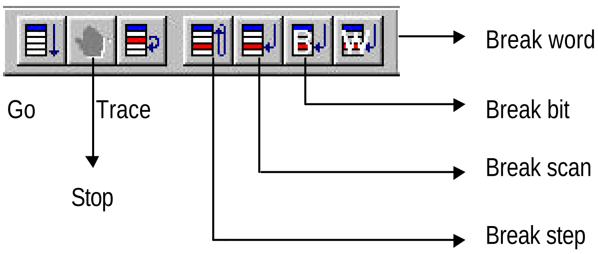


- Editing a program is not available in Debug Mode.
- Click **Online-Mode Change- Debug Mode**.
- Red Mark indicates the break point that the Debugging operation stops to.

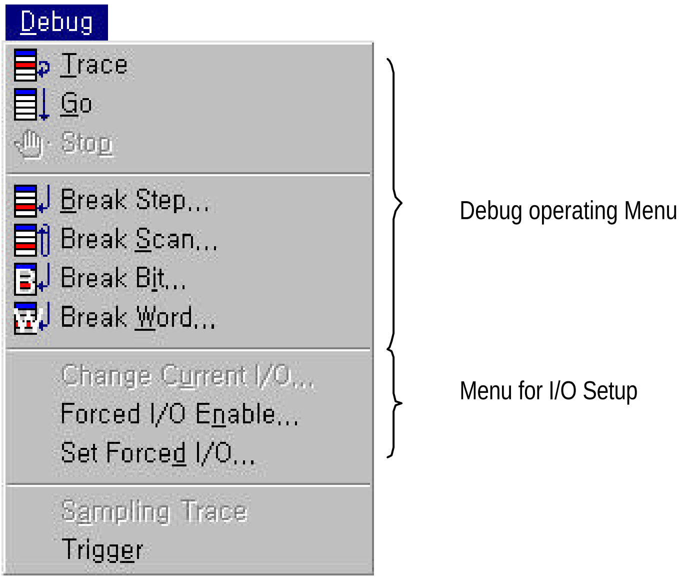


7. 1 Tool Bar for Debugging

- ♦ This Tool Bar is shown only in the Debug Mode.



7. 2 Debug Menu



7. 2 .1 Trace

- ♦ Trace means to run commands one by one.
- ♦ Click **Debug-Trace**( to move the break point by one step.

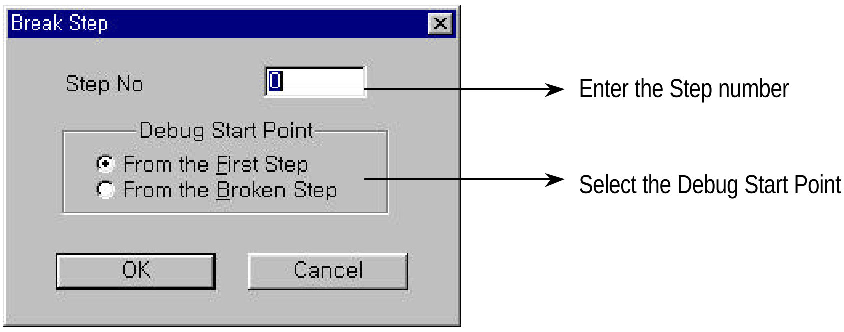
7. 2 .2 Go

- ♦ To debug the program by the debug option that are set in the last time, select **Debug-Go**(

7. 2. 3 Stop

- ♦ To stop the debugging, select **Debug-Stop**().

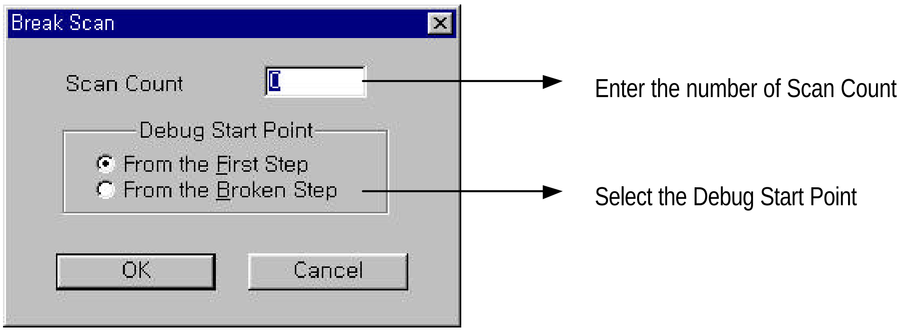
7. 2. 4 Break Step



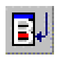
- In order to execute debugging for some assigned step, , select **Debug-Break Step** (.

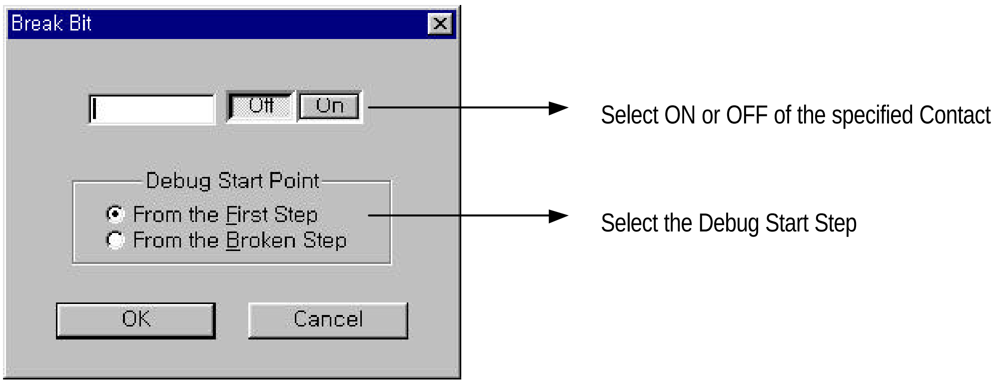
7. 2. 5 Break Scan

- In order to execute Debugging for some assigned scan, select **Debug-Break Scan** (.



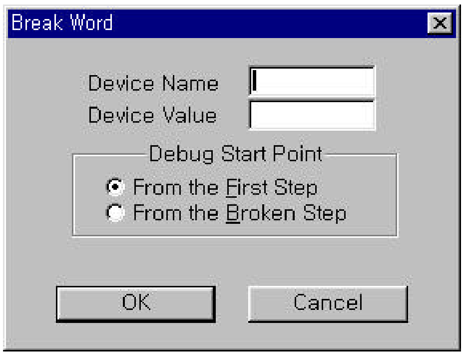
7. 2. 6 Break Bit

- In order to execute Debugging until the specific contact condition is satisfied, select **Debug-Break Bit** (



7. 2. 7 Break Word

♦ In order to execute Debugging until the specific device data is satisfied, select **Debug-Break Word** (



7. 3 I/O Setting

♦ This Function is to change the current value of Device or I/O value by force.

♦ This Function is available for all Modes.

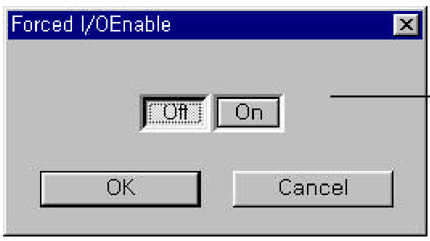
7. 3. 1 Change I/O Enable

♦ To change the current value of Device, select **Debug-Change Current I/O**.

7. 3. 2 Forced I/O Enable

♦ This Function is to enable the Forced I/O Value (Bit data).

♦ If this function is enabled, the Forced I/O values assigned in Chapter. 7.3.3 will take effect.



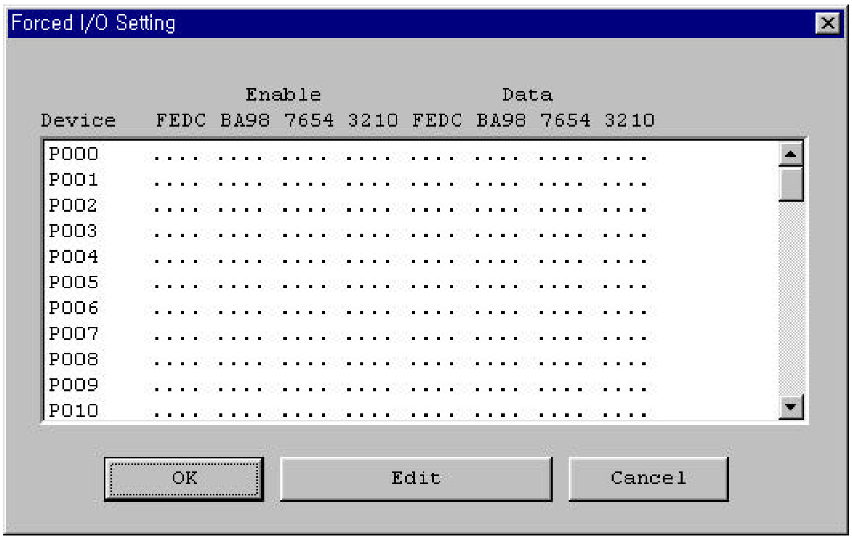
Off : Disable

On : Enable

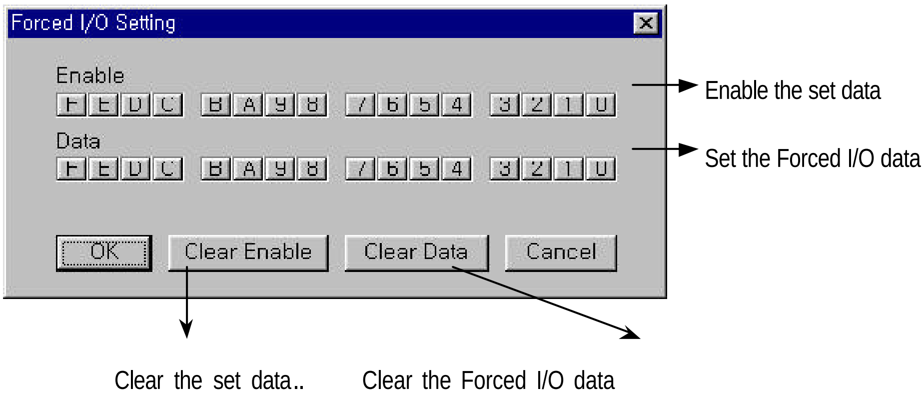
♦ Click OK button after selecting On/Off.

7. 3. 3 Forced I/O Setting

♦ This Function is to set the Forced I/O value.



- Select **Debug-Set Forced I/O**.
- Select I/O's that you want to set by force and click Edit button.



- Set the Forced I/O data. If you set the Forced I/O data without setting the Enable data, the Forced I/O Function will not activated.
- Click OK button after setting. The set status will be shown in the Forced I/O setting box.

7. 4 Trigger

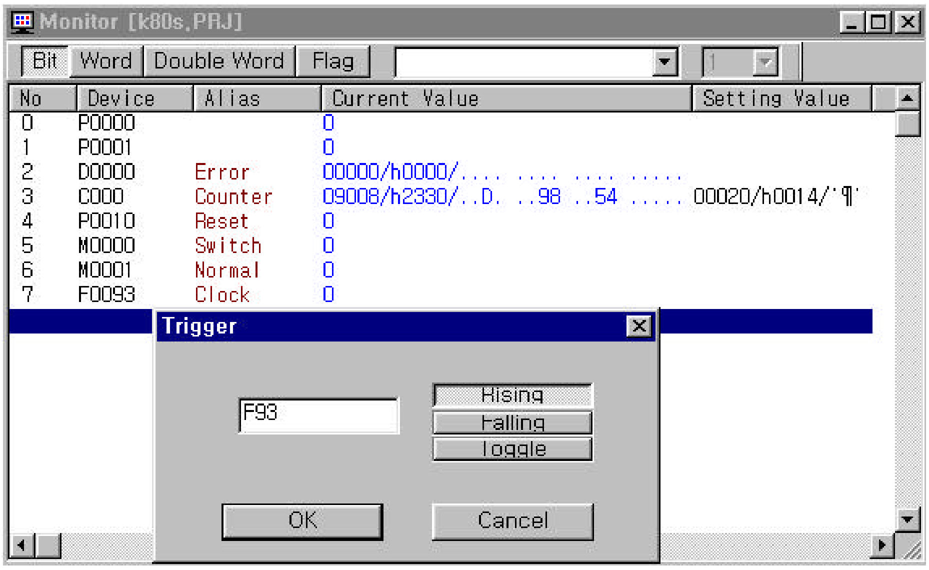
◆ Trigger Function is to monitor the data of the devices when the setting condition is satisfied.

◆ This Function is available only when the monitor window is activated.

◆ During the Trigger process, other windows are paused

After the completion of the Trigger Function, monitoring is paused. In order to monitor them again press OK button.

◆ After activate monitor window and monitoring on , select **Debug-Trigger**.



◆ Enter the data to be triggered in the input box and the execution condition.

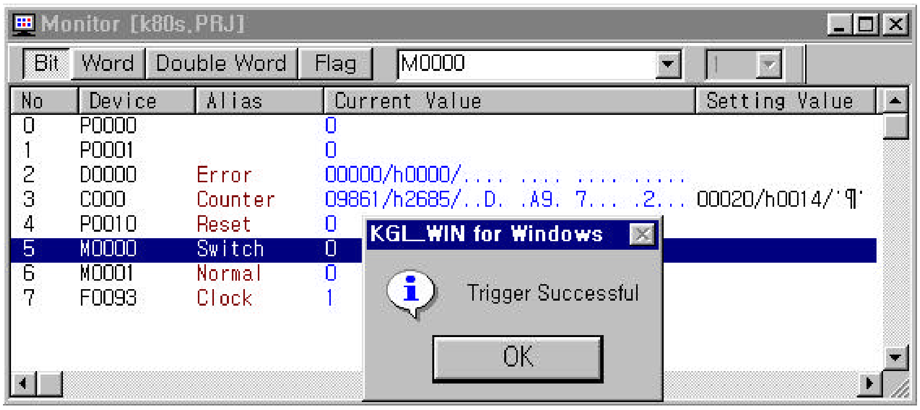
• Rising : Trigger is executed when data is changed low into high.

• Falling : Trigger is executed when data is changed high into low.

• Rising : Trigger is executed when data is changed high into low. Or when changed low into high.

◆ Example of F0093, trigger is executed at rising edge of F0093.

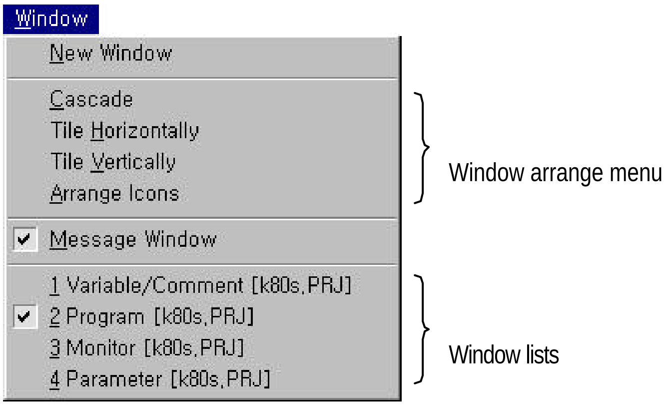
◆ When trigger is completed, success massage box is appeared and monitor window is paused



Chapter. 8 Option

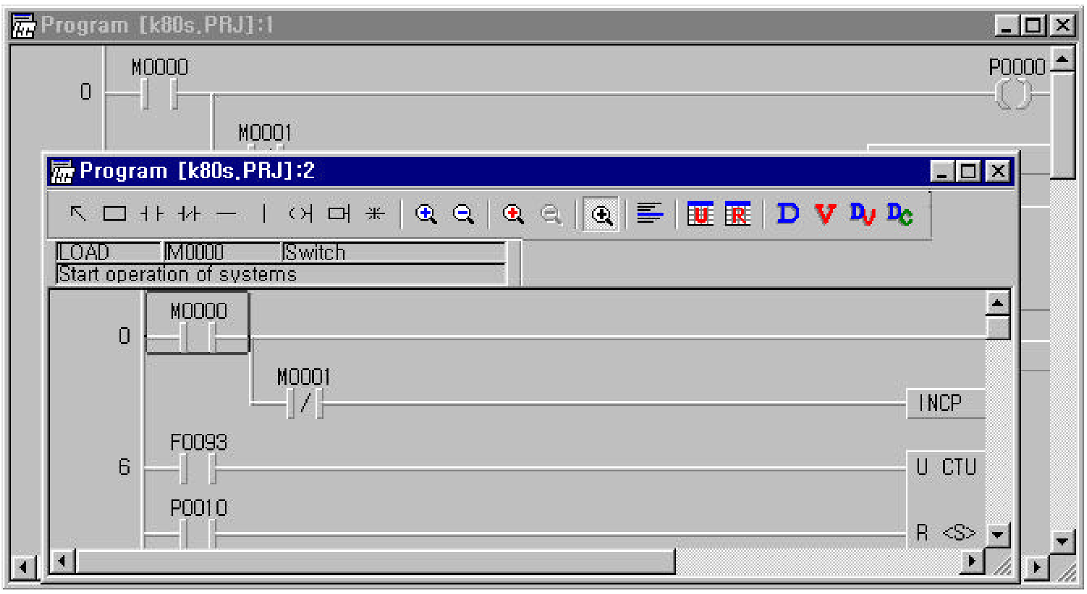
Chapter. 8 Option

8. 1 Window Menu

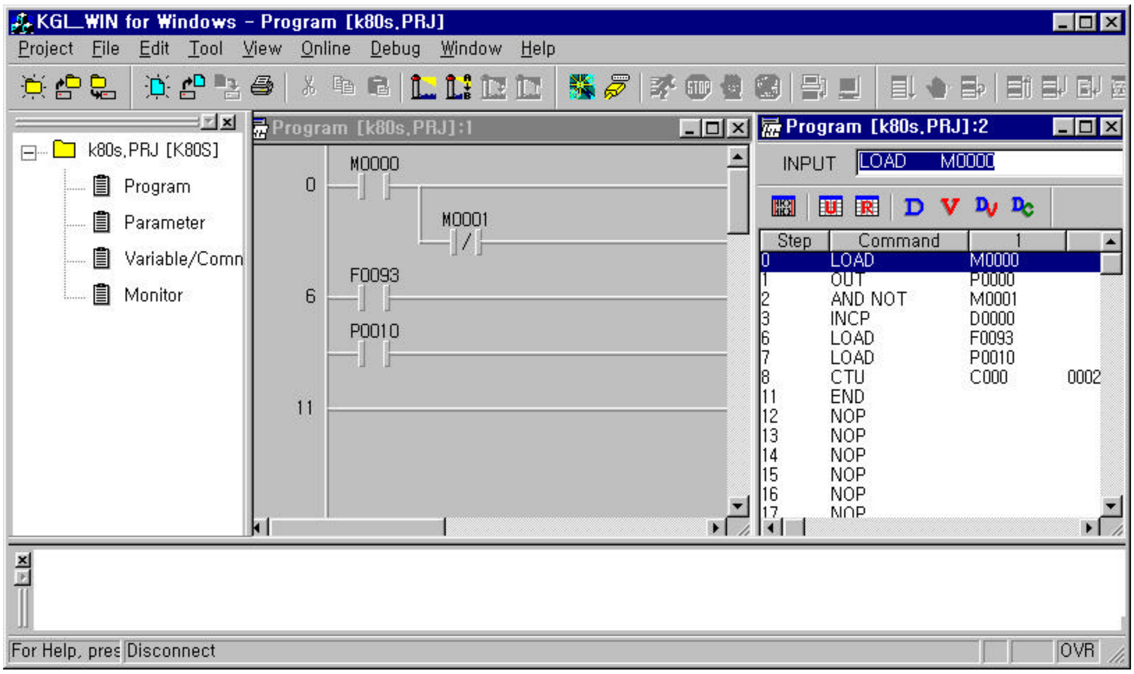


8. 1 .1 New window

- ♦ Open new window that has same contents. Currently activated window(program, parameter, variable/comment) is opened.
- ♦ Select menu window – New window. After activate window to make new window.



- ♦ New window menu edits different window with same contents.
- ♦ When user edits one window, at the same time contents of different window
- ♦ This function usefully edits program window at ladder mode viewing mnemonic program.
- ♦ Names of new window is program2, parameter2, variable/comment2.

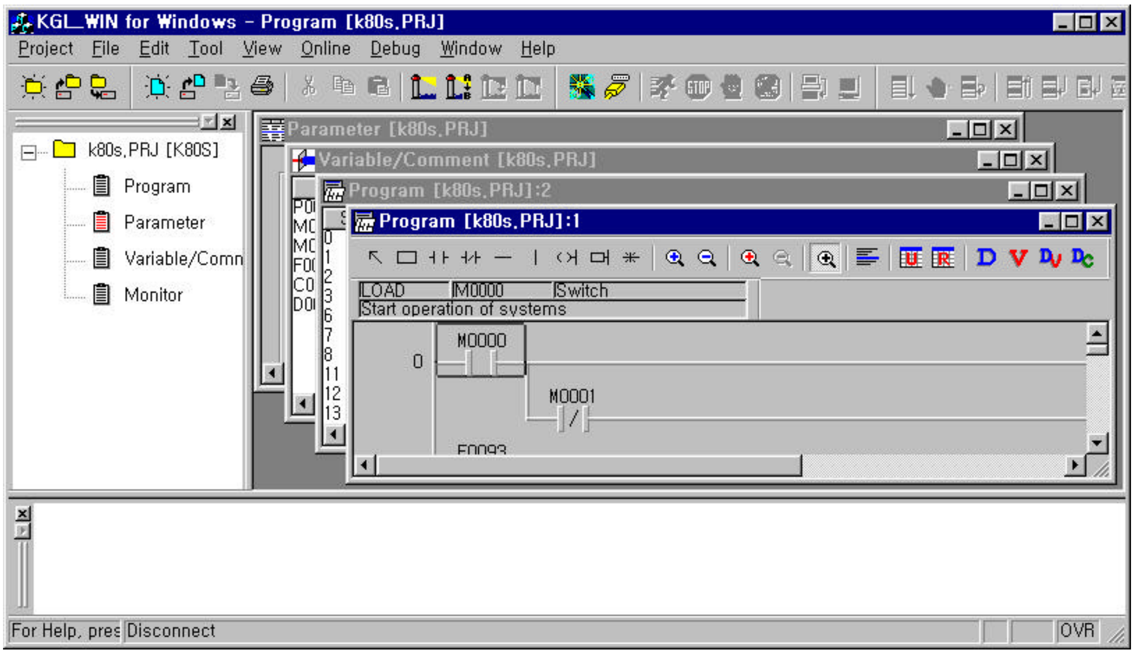


8. 1 .2 Window Arrange

- ♦ This function arrange many window in line

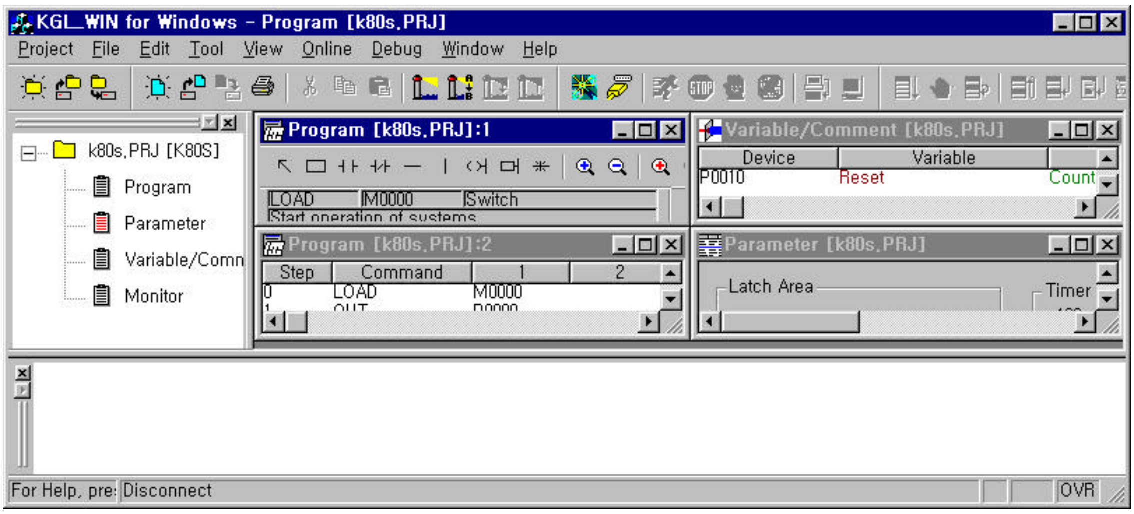
1) Cascade

- Windows are arranged in cascade form.



2) Tile horizontally

- Windows are arranged in Tile horizontally



3) Tile vertically

-. Windows are arranged in Tile vertically.

4) Arrange icon

-. This function arranges icon.

8. 1 .3 Window List

- This function lists used windows. And display activated window.
- Activated window is marked v, and select window for activate.

8. 2 Help Menu

- KGLWIN has various, convenient Help function.
- KGLIWN Help menus are below.

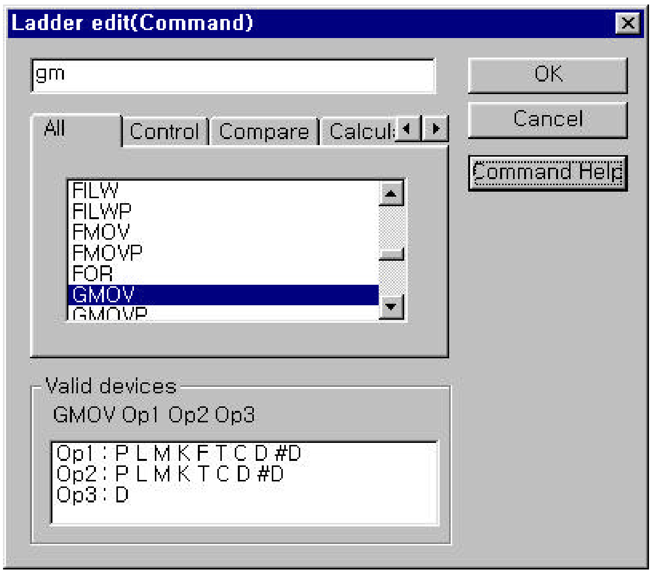


8. 2 .1 KGLWIN Help

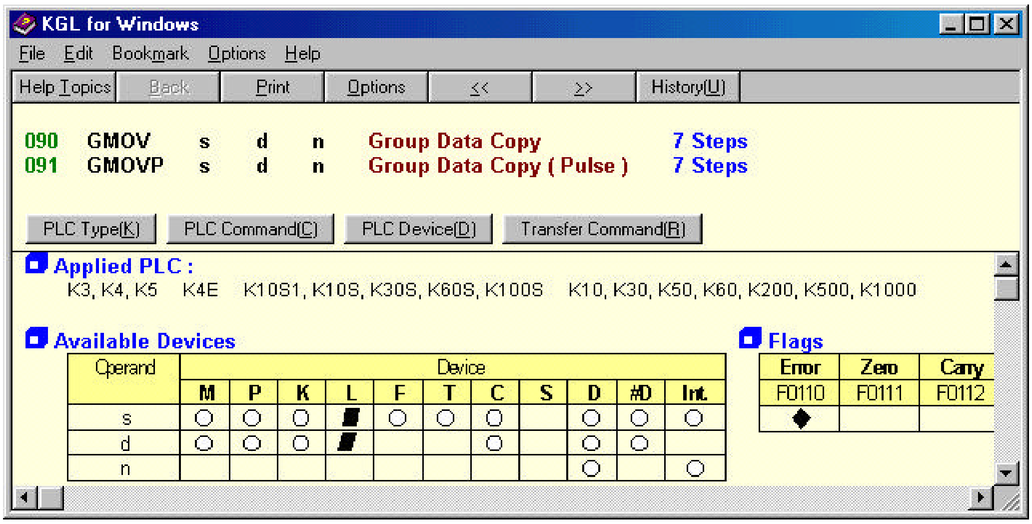
- KGLWIN Help shows index of PLC devices and commands.
- KGLWIN Help function enable users search each instruction quickly.

8. 2 .2 Search Help (F2)

- In case of editing program, this function enable you reference help for instruction



- If you want to see reference of instruction, click Command Help button.

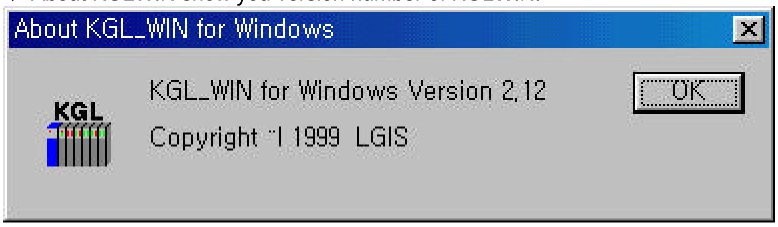


8. 2. 3 Help in Help

◆ Help in Help show you how to use help menu in window program.

8. 2. 4 About KGLWIN

◆ About KGLWIN show you version number of KGLWIN.

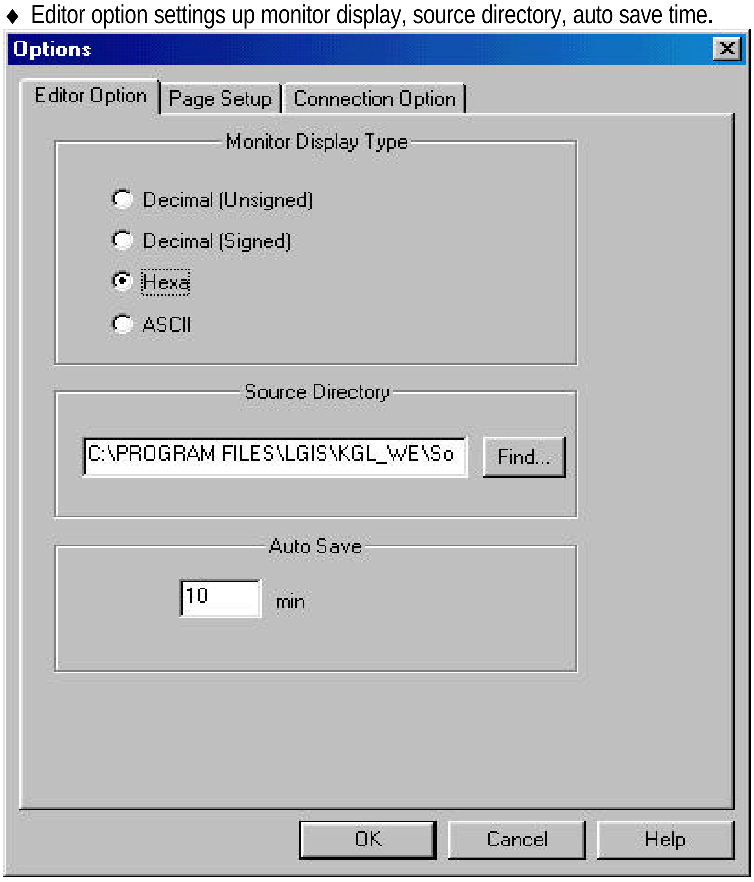


8. 3 Option

◆ Option settings up option for environment of KGLWIN.

8. 3. 1 Editor option

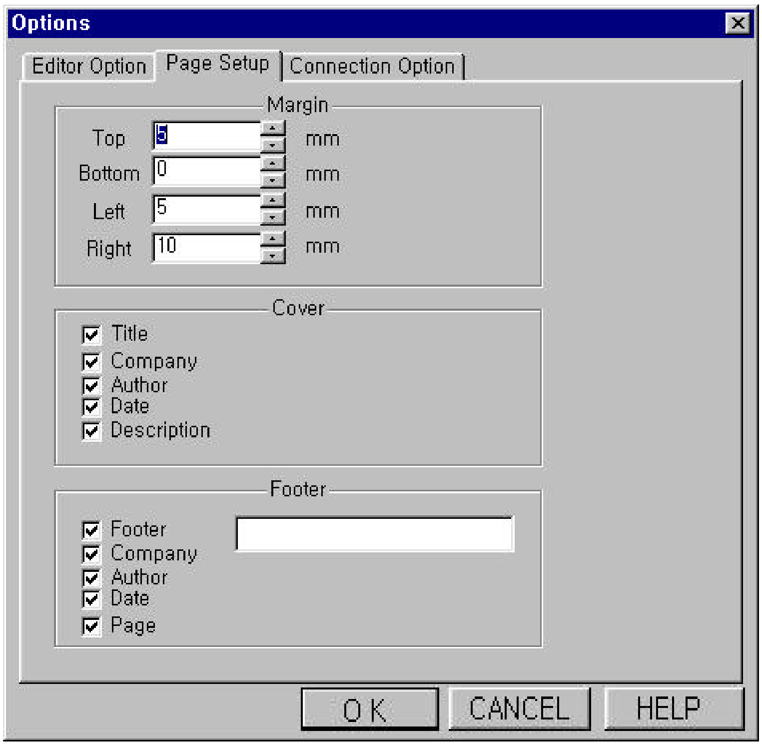
◆ Editor option settings up monitor display, source directory, auto save time.



- Source directory means directory that project open or save
- Auto save is setting up time save project automatically. Setting "0" mean no auto save time.

8. 3. 2 Page setup

- Page setup is setting up print page.



- Margin setup is fixing margin of print page.
- Cover setup is determining of print items in cover page.
- Footer setup is determining of print items in footer item. Footer is edited in page setup.

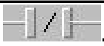
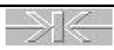
8. 3. 3 Connection option

- This option setup connection option for PC with PLC. Details refer to Chapter1.2.

Appendix

Appendix : Hot-Keys

1.1 Hot-Keys for Ladder Program Mode

Hot-Keys	Description
F3	 Open Ladder Editor Box for Normally Open Contact
F4	. Open Ladder Editor Box for Normally Closed Contact
F9	 Open Ladder Editor Box for Output Coil
F10	Open Ladder Editor Box for Applied Instructions
N	 Insert NOT Instruction
F6	Draw a Vertical Line
F5	Draw a Horizontal Line
Ctrl + F5	Draw a Horizontal Line by the end of line
Ctrl + Space	Toggle the program(Ladder ⇔ Mnemonic)
Ctrl + F	Open Find dialog box
Ctrl + H	Open Replace dialog box
Ctrl + F3	Search again Forward
Ctrl + B	Search again Backward
Ctrl + G	Open Go to Step dialog box
Ctrl + M	Insert one line
Ctrl + U	Delete one line
Shift + ↑	Select the block upward
Shift + ↓	Select the block downward
Ctrl + X	Cut the selected block (Shift + Delete)
Ctrl + C	Copy the selected block.(Ctrl + Insert)
Ctrl + V	Paste the selected block(Shift + Insert)
Ctrl + Delete	Delete the selected block
F1	Open Help window
Shift + F1	Open Help about the Item that the cursor is placed on.
F2	Open Help about the instruction that the cursor is placed on
Ctrl + Enter	Change the line when entering Rung Comment or Output Comment

1. 2 Hot-Keys for Editing Block

Hot-Keys	Descriptions
Shift + ↑	Select the block upward
Shift + ↓	Select the block downward
Ctrl + X	Cut the selected block (Shift + Delete)
Ctrl + C	Copy the selected block.(Ctrl + Insert)
Ctrl + V	Paste the selected block(Shift + Insert)
Ctrl + Delete	Delete the selected block

1. 3 Hot-Keys for Mnemonic Program Mode

Hot-Keys	Descriptions
Ctrl + Space	Toggle the program(Mnemonic ⇔ Ladder)
Ctrl + F	Open Find dialog box
Ctrl + H	Open Replace dialog box
Ctrl + F3	Search again Forward
Ctrl + B	Search again Backward
Ctrl + G	Open Go to Step dialog box
Ctrl + M	Insert one line
Ctrl + U	Delete one line
Shift + ↑	Select the block upward
Shift + ↓	Select the block downward
Ctrl + X	Cut the selected block (Shift + Delete)
Ctrl + C	Copy the selected block.(Ctrl + Insert)
Ctrl + V	Paste the selected block(Shift + Insert)
Ctrl + Delete	Delete the selected block
F1	Open Help window
Shift + F1	Open Help about the Item that the cursor is placed on.
F2	Open Help about the instruction that the cursor is placed on

1. 4 Hot-Keys for Online Mode

Hot-Keys	Descriptions
Ctrl + R	Perform ‘Connect+Download+Run+Monitor Start’
Ctrl + T	Perform Step Over Function in Debug Mode
Ctrl + I	Open Change Current I/O dialog box

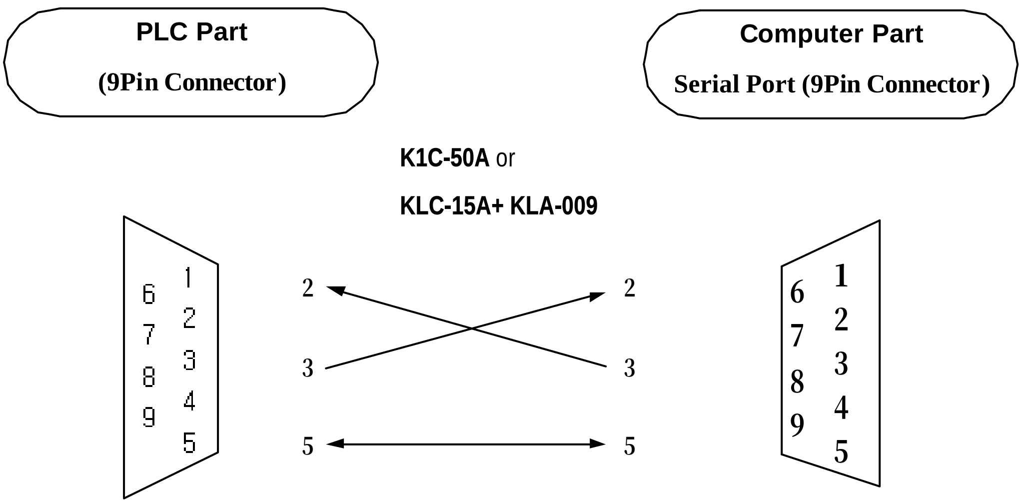
1. 5 Hot-Keys for Cursor Move

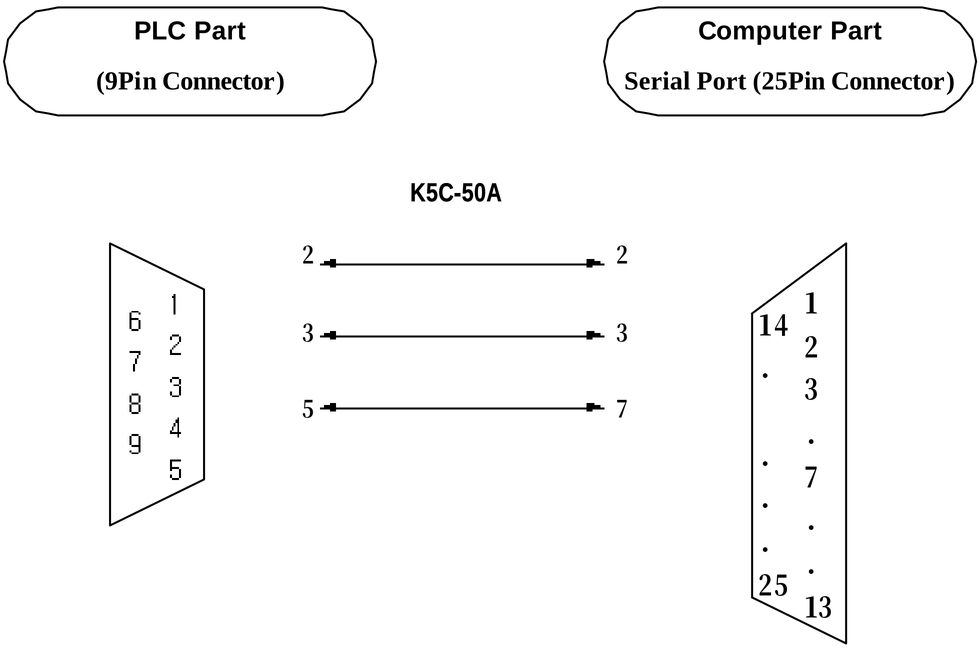
Hot-Keys	Description
↑	Move Pointer up in window
↓	Move Pointer down in window
←	Move Pointer left in window
→	Move Pointer right in window
Page Up	Move one page up in window
Page Down	Move one page down in window
Home	Move to the left end of the current line
End	Move to the right end of the current line
Ctrl + Home	Move to 0 Step
Ctrl + End	Move to End Step
Ctrl + Page Up	Move the first step excluding NOP Instruction
Ctrl + Page Down	Move the end step excluding NOP Instruction

1.6 Cable standards for communication with PLC

KGLWIN shall be connected as follows for communication with PLC.

- *PLC communication : PLC Mode change, monitoring, program read/write function.*
- *PLC series :LG MASTER-K series.*





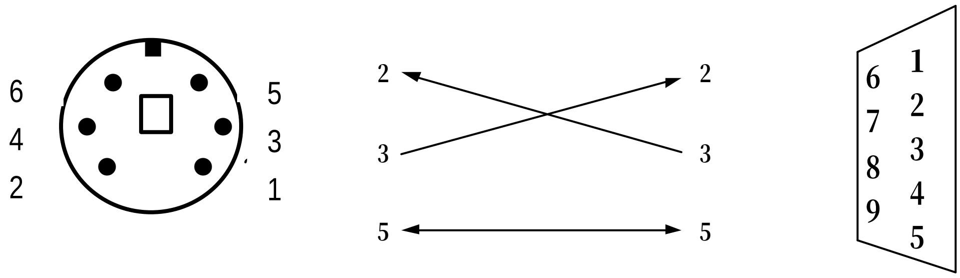
PLC Part

(6Pin Connector)

Computer Part

Serial Port (9Pin Connector)

KLC-010 + KLA-009

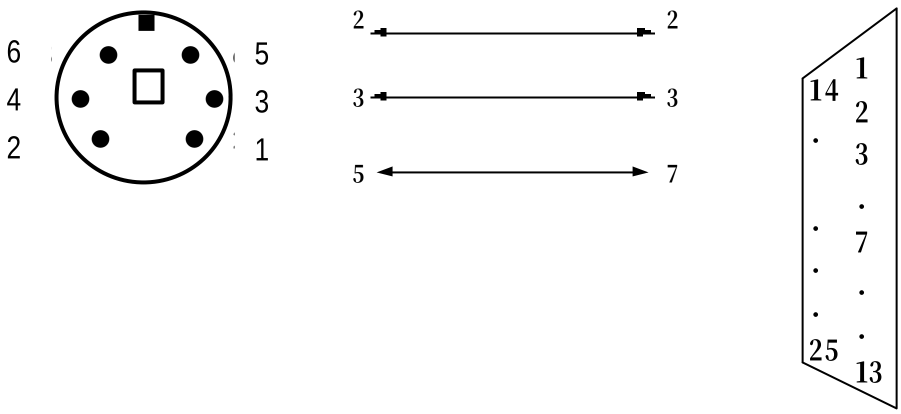


PLC Part

(6Pin Connector)

Computer Part

Serial Port (25Pin Connector)



NOTE

1) CPU Module Port (6P) : LG Master-K 10S, K10S1
2) CPU Module Port (9P) : All MASTER-K series except K10S and K10S1